Ownership structure as a mechanism of corporate governance

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Publication date:
2004

Document Version
Publisher's PDF, also known as Version of record

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PROEFSCHRIFT

ter verkrijging van de graad van doctor aan de Universiteit van Tilburg, op gezag van de rector magnificus, prof. dr. F. A. van der Duyn Schouten, in het openbaar te verdedigen ten overstaan van een door het college voor promoties aangewezen commissie in de aula van de Universiteit op vrijdag 12 november 2004 om 10.15 uur

door

GRZEGORZ TROJANOWSKI

geboren op 10 augustus 1975 te Lublin, Polen

PROMOTOR: prof. dr. F.A. de Roon

COPROMOTORES: dr. L.D.R. Renneboog

dr. U. Hege

To my parents

Preface

This thesis is the outcome of a research project carried out during my doctoral studies at CentER Graduate School (Tilburg University) over the period 2000-2004. I also acknowledge financial support from the European Union Marie Curie Fellowship Programme. It allowed me to spend the final months of my doctoral studies visiting ECARES (Université Libre de Bruxelles).

My special words of appreciation go to my supervisory team. I benefited enormously from the guidance offered by Luc who carefully monitored my research progress over the whole 4-year period and constantly provided me with insightful comments and invaluable suggestions. I remain extremely grateful for his patience and effort invested in improving my style of writing. Luc also co-authored some of the essays included in this thesis and provided me with much of the data used in the empirical analyses. Hereby I would like to express my hope that we will be able to continue this fruitful co-operation in the future.

My gratitude extends to Uli, whose encouragement was essential to motivate me to start the doctoral project at all. His advice also helped me along the way, as he was always ready to discuss my ideas and results. Moreover, I remain indebted to both Luc and Uli for a tremendous support they provided me during my job search process. Finally, I want to thank Frans who kindly agreed to act as a third supervisor and who offered his help in dealing with some econometric problems I encountered while writing the thesis.

I would like to express my gratitude to Marco Becht, Piet Duffhues, Marc Goergen, and Ian Tonks for joining my dissertation committee. I highly appreciate their willingness to read and assess the thesis. I remain grateful for all the comments I received. I would also like to thank Anna and Dorota for agreeing to be my paranymphs at the defence ceremony.

Over the period of my doctoral studies I benefited considerably from academic discussions with fellow Ph.D. students. In this context, I would like to thank Dorota for her comments and suggestions that helped me enormously in developing some of the ideas pursued in this dissertation. I also highly appreciate the feedback from Alexei, Anna, Grzesiek, Jana, Marta, Martyna, and Steffan on earlier drafts of (some of) the thesis essays as well as on my seminar performance. Finally, I would like to thank Ralph for composing the Dutch summary of this thesis.

My professional development (both in terms of research and teaching) would not be possible without the help of my colleagues from the Department of Finance who were eager to share their experience and provide me with advice when I needed it most. They should also be thanked for arranging numerous social events and making the Department a great place to work. In particular, I have enjoyed a lot the company of Rob and Chendi with whom I shared the office in Tilburg.

I would like to thank the Polish crowd (both Annas, Dorota, Gosia, Grzesiek, Maciek, Marta, Martyna, and Pawel) as well as my foreign Ph.D. friends (Alexei, Ebru, Jana, and many others) for making my stay in Tilburg an enjoyable experience also from a social point of view. Over the last couple of years, we shared numerous unforgettable moments. Therefore my stay in the Netherlands will always remain one of the nicest periods of my life.

Last but not least, I am grateful to my parents and sisters for the support they offered me during my whole stay in the Netherlands. I would like to thank them for cheering me up when I needed it and for sharing the joys of this period.

Table of contents

Chapter 1

Introduction

1.1. The governance role of shareholder control structures

The presence of agency conflicts between shareholders and managers who control corporate resources in modern companies has led to the emergence of governance mechanisms assuring that financiers' funds are not expropriated or wasted on unattractive projects (Jensen and Meckling, 1976; Shleifer and Vishny, 1997). In a vast majority of European countries, ownership concentration is one of the most important internal mechanisms of corporate governance (Becht and Röell, 1999; La Porta et al., 1999). Minority shareholders' protection in these countries is weaker than in Anglo-American ones (La Porta et al., 1998), and therefore, only large blocks, carrying significant control power, provide appropriate guarantees for investors. Still, even in the US and the UK, the presence of large shareholders is argued to affect firm value (Morck et al., 1988; McConnel and Servaes, 1990 and 1995) and shown to influence the efficiency of governance mechanisms (Moh'd et al., 1995, Denis et al., 1997; Franks et al., 2001; Farinha, 2003).

The theoretical literature stipulates that the presence of a large shareholder procures benefits, but also comes at a cost. Shleifer and Vishny (1986) and Kyle and Vila (1991) suggest that the presence of a block holder in a company's ownership structure makes value-increasing takeovers possible, and thus helps to overcome free-rider problems pointed out by Grossman and Hart (1980). Moreover, Admati et al. (1994), Maug (1998), Kahn and Winton

(1998) show that in the presence of block holders, costly monitoring takes place despite free-riding behavior of dispersed shareholders. The costs of concentrated ownership may be substantial, however. First, control by a large shareholder results in reduced risk sharing (Demsetz and Lehn, 1985; Admati et al., 1994). Second, equity concentration reduces market liquidity (Coffee, 1991; Bolton and Thadden, 1998). Third, monitoring by an investor holding an equity stake can lead to excessive risk taking in managerial decisions, especially in highly leveraged companies (Jensen and Meckling, 1976; Coffee, 1991). Fourth, Burkart et al. (1997) and Pagano and Röell (1998) point out that even when tight control by shareholders is *ex post* efficient, *ex ante* it constitutes an expropriation threat that reduces managerial incentives to exert effort and undertake value maximizing strategies (the so-called 'over-monitoring' effect).

This dissertation focuses on the costs and benefits of ownership concentration. It consists of four chapters investigating the role of shareholder control structures in different corporate governance regimes. Section 1.2 below outlines major findings of those essays. Chapter 2 analyzes the effects of substantial changes in the ownership structures of the Polish listed companies.[1] Chapter 3 investigates the link between control shareholder structures and the governance efficiency of managerial labor market mechanisms in the UK.[2] Chapter 4

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[1] Chapter 2 is largely based on Trojanowski (2002 and 2003). I would like to thank Steffan Berridge, Jana Fidrmuc, Ulrich Hege, Martyna Janowicz, Dorota Piaskowska, Luc Renneboog, Frans de Roon, an anonymous referee, and the participants of the CEPR Transition Economics Workshop (Portoroz, 2001), the 16th European Economic Association Annual Congress (Lausanne, 2001), the workshop 'Corporate Governance in Transition Economies' (Moscow, 2002), the 30th Annual Meeting of the European Finance Association (Glasgow, 2003), and the seminars in Tilburg and Paris for helpful comments on earlier drafts of this chapter.

[2] Chapter 3 is a result of a research project conducted jointly with Luc Renneboog. It extends the results of Renneboog and Trojanowski (2002a, 2002b, and 2003). I would like to thank Rafel Crespi, Julian Franks, Carles Gispert, Alexei Goraiev, Uli Hege, Arthur Korteweg, Colin Mayer, Grzegorz Pawlina, Dorota Piaskowska, Lukasz Pomorski, Frans de Roon, Bas Werker, an anonymous referee, and the participants in the seminars at Oxford University, University of Reading, Lancaster University, Erasmus University (Rotterdam), CSEF (University of Salerno), ESADE (Barcelona), IÈSEG (Catholic University of Lille), Tilburg University, University of Exeter, University of Aarhus, University of Bath, the EFMA Annual Conference (London, 2002), the EFA Annual Conference (Berlin, 2002), the International Conference on Corporate Governance

examines the patterns in payout policy of the UK firms in the 1990s and assesses empirically the validity of clientele theories of payout.[3] Chapter 5 relates payout ratios to control structures for the UK firms.[4] A Dutch summary of the dissertation follows.

1.2. Major findings

Chapter 2 investigates the valuation effects of share block transfers and employs agency theory to explain the determinants of equity block premia. A sample of transactions from Poland is used to measure the benefits and costs of ownership concentration. Block premia are found to be substantially lower than in well-developed markets, in spite of the weaker minority shareholders' protection in transitional economies. Shareholders expect to benefit from intensified monitoring and from corporate restructuring resulting from block acquisitions. Still, shareholders are wary of the expropriation stemming from the extraction of private benefits of control by block holders. The opportunities to extract such benefits are found to depend not only on the size of the block holders' stakes, but also on the relative power of other investors. Finally, the results document a positive role of the State as an investor in listed companies.

Chapter 3 simultaneously analyzes two mechanisms of the managerial labor market: CEO turnover and monetary remuneration schemes. Sample selection models and hazard analyses are applied to a random sample of 250 firms listed on the London Stock Exchange.

Developments (Birmingham, 2002) as well as the 2nd Corporate Governance Conference organized by Humboldt University and Stanford University (Berlin, 2003) for valuable comments on earlier drafts of this chapter.

[3] I would like to thank Uli Hege, Rezaul Kabir, Anna Nadolska, Steven Ongena, Frederic Palomino, Dorota Piaskowska, Luc Renneboog, Frans de Roon, and the participants of the seminar at Tilburg University for valuable comments on earlier drafts of Chapter 4.

[4] Chapter 5 is a revised version of the paper by Trojanowski (2004). I would like to thank Marc Deloof, Uli Hege, Nancy Huyghebaert, Rezaul Kabir, Steven Ongena, Frederic Palomino, Enrico Perotti, Dorota Piaskowska, Abraham Ravid, Luc Renneboog, Frans de Roon, the participants of the Leuven Young Financial Researchers Day 2004, of the Spring Meeting of Young Economists (Warsaw, 2004), of the EFMA Annual Meeting (Basel, 2004), of the EFA PhD Tutorial (Maastricht, 2004), and of the seminars at Tilburg University and the University of Antwerp for valuable comments on earlier drafts of this chapter.

My approach yields novel results (compared to earlier UK research): both the CEOs' monetary compensation and CEO replacement are strongly performance-sensitive. There is little evidence of outside shareholder monitoring whereas CEOs with strong voting power successfully resist replacement irrespective of corporate performance. With regard to CEO remuneration, the managerial power model of Bebchuk and Fried (2003) and the skimming model of Bertrand and Mullainathan (2000) sketches a better picture of the managerial remuneration practices in the UK than the contractual alignment of interests theory of the traditional agency literature (e.g. Murphy, 1986) for the following reasons: (i) CEOs with strong voting power choose their own benchmark (accounting performance) whereas in firms with strong outside block holders, remuneration is related to shareholder value creation, (ii) the presence of a remuneration committee has no impact on remuneration, (iii) equity-owning CEOs compensate disappointing stock performance by augmenting their cash-based compensation package (salary and bonus), which suggests self-dealing.

Chapter 4 examines the payout policy of UK firms listed on the London Stock Exchange during the 1990s. It complements the existing payout studies by analyzing jointly the trends in dividends and share repurchases. Unlike in the US (Fama and French, 2001), I find that, in the UK, firms do not demonstrate a decreasing propensity to distribute funds to shareholders. The role of share repurchases is increasing, but dividends still constitute a vast proportion of the total payout. Firms repurchasing shares usually pay dividends as well. I also document that there is a strong relationship between the presence of block holders and the choice of the payout channel: firms with concentrated ownership tend to opt for dividends rather than share repurchases, irrespectively of the identity of the controlling shareholder. I argue that the differential taxation of dividends and capital gains as well as the insider trading regulation may affect the relative attractiveness of dividends and share repurchases to large shareholders.

Chapter 5 extends the analysis of the payout policies of UK firms. In a dynamic panel data regression setting (Blundell and Bond, 1998), I relate target payout ratios to control

structure variables. Profitability drives payout decisions of the UK companies, but the presence of strong block holders or block holder coalitions considerably weakens the relationship between corporate earnings and payout dynamics. While the impact of the voting power of shareholders' coalitions on payout ratios is found to be always negative, the magnitude of this effect differs across different categories of block holders (i.e. industrial firms, outside individuals, directors, financial institutions). The controlling shareholders appear to trade off the agency problems of free cash flow against the risk of underinvestment, and try to enforce payout policies that optimally balance these two costs. Finally, the chapter improves upon some methodological flaws of the recent empirical studies of payout policy.

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Chapter 2

Equity Block Transfers in Transition Economies: Evidence from Poland

2.1. Introduction

This chapter takes an agency perspective to explain both costs and benefits of ownership concentration. Large block holdings help to curb agency problems between shareholders, who finance companies, and managers, who control corporate resources on a day-to-day basis (Admati et al., 1994; Maug, 1998; Kahn and Winton, 1994). Yet, delegation of monitoring to large shareholders may be a source of other agency problems that emerge for various stakeholders of a firm (Burkart et al., 2000). As neither the costs, nor the benefits of ownership concentration are directly observable, I analyze agency problems of ownership concentration by studying block transactions. In particular, I examine the announcement effects of block transactions and the determinants of block premia (as in Banerjee et al., 1997 and Bethel et al., 1998).

There exists vast empirical literature analyzing block holdings and block transactions within the agency framework.[1] However, the focus has been mainly on developed economies, in which minority investors are relatively well-protected. This chapter is one of the first in-

[1] Recent contributions include Holderness and Sheehan (1988), Barclay and Holderness (1989, 1991, and 1992), Zingales (1994, 1995), Sudarsanam (1996), Keim and Madhavan (1996), Banerjee et al. (1997), Bethel et al. (1998), Dyck and Zingales (2004). Their findings are summarized in the next section.

depth studies of block transfers in a transition economy.[2] I analyze a sample of block transactions from Poland for the following reasons. First, analyzing data from a young market enables me to detect certain phenomena that are specific to corporate governance in emerging markets, such as insufficient protection of minority shareholders' rights, lack of minority shareholders' expertise, and the special role of the State Treasury. Second, a large number of block transactions and little 'legacy' ownership structures in Polish companies make them a particularly interesting object of analysis. Last but not least, employing a so far unexploited data set allows me to avoid the data-snooping bias.

The chapter documents the remarkably low level of block premia in Poland which occurs in spite of the inferior governance standards in transition economies. One plausible reason is the presence of liquidity costs that influence the level of block premia. Shareholders expect to benefit from monitoring and corporate restructuring stimulated by block acquirers. Still, shareholders are wary of the expropriation stemming from the extraction of private benefits of control by large block holders. The opportunities to extract such benefits are found to depend not only on the size of the block holders' stakes, but also on the relative power of other investors. The additional result of the analysis is that privatizations are perceived less favorably by the market than other types of block transfers.

The remainder of the chapter is organized as follows. Section 2.2 discusses the role of ownership concentration from an agency theory perspective and surveys the related empirical literature. Section 2.3 develops and motivates research hypotheses concerning the valuation effects of block transactions and determinants of block premia. In the subsequent part, the methodology is explained. Section 2.5 provides details on data collection procedure and describes the variables. Section 2.6 outlines the results pertaining to the valuation effects of block transactions, while the subsequent section summarizes the evidence concerning the

[2] Gregoric and Vespro (2003) analyze a small sample of block transactions in Slovenian listed firms. Atanasov (2001) investigates block transfers and private benefits of control in a larger sample of Bulgarian companies, but his sample is restricted to privatization deals only. Finally, the cross-country study by Dyck and Zingales (2004) only includes a tiny set of observations from Czech Republic and Poland.

determinants of block premia. Section 2.8 discusses additional analyses and robustness checks. Section 2.9 concludes.

2.2. Prior research

2.2.1. Theoretical background

The presence of a large shareholder procures benefits, but also comes at a cost. Shleifer and Vishny (1986) and Kyle and Vila (1991) suggest that the presence of a block holder in a company's ownership structure makes value-increasing takeovers possible, and thus helps to overcome free-rider problems pointed out by Grossman and Hart (1980). Moreover, Admati et al. (1994), Maug (1998), Kahn and Winton (1998) show that in the presence of block holders, costly monitoring takes place despite free-riding behavior of dispersed shareholders. The costs of concentrated ownership may be substantial, however. First, control by a large shareholder results in reduced risk sharing (Demsetz and Lehn, 1985; Admati et al., 1994). Second, equity concentration reduces market liquidity (Coffee, 1991; Bolton and Thadden, 1998).[3] Third, monitoring by an investor holding an equity stake can lead to excessive risk taking in managerial decisions, especially in highly leveraged companies (Jensen and Meckling, 1976; Coffee, 1991). Fourth, Burkart et al. (1997) and Pagano and Röell (1998) point out that even when tight control by shareholders is *ex post* efficient, *ex ante* it constitutes an expropriation threat that reduces managerial incentives to exert effort and undertake value maximizing strategies (the so-called 'over-monitoring' effect).

Grossman and Hart (1988) stress that a significant stake in a company brings about benefits of control, which can be divided into two classes: private benefits and security benefits. The latter class includes benefits of ownership concentration that are shared and

[3] Coffee (1991) argues that only an illiquid market makes institutional investors intervene rather than sell their stakes. Bolton and Thadden (1998) illustrate that the costs of having a large shareholder may outweigh the benefits, even if the control by block holders always has a positive externality on other shareholders.

enjoyed by all shareholders (e.g. positive effects of monitoring). Control rights can also provide (large) investors with private benefits of control, when these investors have access to private information, are able to freeze-out minority shareholders at a price below the value of their shares, and – in extreme cases – can divert resources from security holders to entities controlled by a block holder (Zwiebel, 1995; Pagano and Röell, 1998; Johnson et al., 2000). Private benefits of control do not necessarily lead to firm value destruction, but in many cases they may result in inefficiencies. Thus, although block holdings can be a mechanism that mitigates agency costs resulting from excessive managerial discretion, these block holdings may bring in another type of agency costs. A large investor may attempt to expropriate small shareholders' rights. Moreover, according to Zwiebel (1995), private benefits of control can be extracted even if a company has multiple large shareholders. He claims that these benefits are divisible, and parties can enjoy them accordingly to their strategic importance measured by Shapley values. Above some threshold, a large block will not be challenged for control. This encourages extraction of private benefits of control at the expense of dispersed small shareholders, and therefore can induce agency problems between various groups of shareholders.

Sale-of-control transactions (as opposed to tender offers) are not plagued by free-rider and pressure-to-tender problems on the seller's side. Still, efficiency problems do arise because such transactions may well have externality effects on minority shareholders (Bebchuk, 1994). As a result of such externalities, inefficient transfers of control may occur, and efficient transfers of control may be frustrated.[4] In a similar vein, Burkart et al. (2000) compare various methods of transferring corporate control and conclude that an increase of the block size effectuated via a block transaction, rather than via a tender offer, may signal an inefficient transfer of control. The reason is that transferring control through a block trade

[4] Inefficient transfers of control occur when the buyer acquires control to extract private benefits of control rather than to monitor and/or improve company's performance. The value of the firm after such a transaction might decrease, but the acquirer is compensated with excessive private benefits of control for the loss on the value of his shares.

preserves the low concentration of the ownership and the corresponding high extraction of private benefits (Bennedsen and Wolfenzon, 2000).

2.2.2. Empirical evidence on valuation effects of block trades

Earlier studies find that block transfers are accompanied by positive abnormal stock performance, and thus, on average, value creating (Holderness and Sheehan, 1988; Sudarsanam, 1996). This effect is documented to be present regardless of the price paid in the transaction (Barclay and Holderness, 1989). The threat of consuming corporate wealth is argued to be absent, since in most companies with a majority shareholder his stake substantially exceeds 50%-threshold (Holderness and Sheehan, 1988). Barclay and Holderness (1991) claim that changes in control improve corporate governance and increase management turnover as well as the intensity of reorganization activities, rather than bring about additional agency problems. Therefore, block transactions in which the purchaser gains control receive a much more favorable market reaction than those where this is not the case. The market appraisal of block transfers is more favorable if such block transfers are accompanied by a tender offer on all outstanding shares (Holderness and Sheehan, 1988). Furthermore, the market also reacts more positively to block transactions for those firms that experience a full acquisition in a post-trade period (Barclay and Holderness, 1992). Still, even when no subsequent takeover occurs, Sudarsanam (1996) documents that the benefits of ownership concentration outweigh the costs: the announcement effect of a block transaction increases with the size of the stake accumulated by the block acquirer.

More recent studies weaken these unconditionally positive conjectures concerning large shareholders. Banerjee et al. (1997) find no abnormal performance that would accompany block transactions in France. However, they argue that the buyer's identity matters for the valuation effect of the block transfer. Specifically, block acquisitions by holding companies may result in value destruction. Bethel et al. (1998) show that, in the US, the block purchases by either financial or strategic investors cause no significant market

reaction, while acquisitions of blocks by activist shareholders are accompanied by significant positive abnormal performance. Such shareholders usually acquire stakes in poorly performing companies, and subsequently pursue restructuring measures leading to considerable improvement of targets' performance (Nesbitt, 1994).

2.2.3. Private benefits of control and determinants of block premia: Empirical evidence

The empirical literature provides support for the existence of private benefits of control, which are found to increase with the size of the stake held by a given block holder (Barclay and Holderness, 1989, 1992; Zingales, 1994, 1995). The benefits depend on ownership structure and vary significantly among countries, possibly due to the differing corporate governance and legal regimes (Nenova, 2003). Estimates of the value of control range from –4% (in Japan) to 65% (in Brazil) of the value of the company's equity (Dyck and Zingales, 2004). Moreover, control rents are affected by firm-specific characteristics, such as industry, company size, leverage, risk, prior performance, corporate charter provisions, and particular characteristics of voting rights (Nicodano and Sembenelli, 2000; Nenova, 2003; Dyck and Zingales, 2004).

Various studies differ with respect to the methodology employed to estimate private benefits of control. Barclay and Holderness (1989, 1992) argue that private benefits of control are reflected in the block premium calculated relative to the post-transaction price. Nicodano and Sembenelli (2000) argue that this methodology is inappropriate, since it neglects ownership structure characteristics in the analysis of control rents. Instead, following Zwiebel's (1995) suggestion, they posit that the fraction of control rights being transferred in a block trade should be measured by changes in strategic importance of shareholders (proxied by changes of Shapley values). Yet another approach is pioneered by Rydqvist (1987) and Zingales (1994), who analyze samples of companies with dual-class stocks. Price comparisons of shares carrying different control rights allows then to make inferences about

the value of private benefits of control. The recent study by Nenova (2003) employs this methodology to illustrate the differences in the benefits of control across 18 countries.

2.3. Research hypotheses

2.3.1. Valuation hypotheses

Much of the prior literature suggests that block transactions should be on average value-creating to the shareholders of the focal firm (e.g. Holderness and Sheehan, 1988; Barclay and Holderness, 1989; Sudarsanam, 1996). Investors can expect that a block deal is a prelude to an attempted takeover as the acquirer builds a toehold (Shleifer and Vishny, 1986). Positive abnormal performance at the announcement of block transaction may also be due to the expected improvement in corporate governance that would result from an increased intensity of monitoring (cf. Admati et al., 1994; Maug, 1998; Kahn and Winton, 1998). In both cases, the positive effect of the block transaction should be more pronounced in situations, where the block acquirer is an investor committed to monitor and, possibly, restructure the target company (Bethel et al., 1998).[5] Such a restructuring is only implemented by an investor who plans a longer-term engagement in a company.

The value of monitoring by the incumbent shareholders is already incorporated in the stock price. A new large investor is likely to contribute new corporate ideas to the target firm (Nesbitt, 1994). Moreover, he can have monitoring skills different from those of the incumbents. Consequently, the market reaction to the entry of a new investor provides an estimate for the incremental value creation resulting from the presence of a new block holder.

Hypothesis 2.1 (Restructuring)*: The stock price reaction to a block transaction is positive. It is more favorable when the block acquirer is a strategic investor and when he is a new shareholder.*

[5] For institutional reasons (see Section 5.2), I refer to such a shareholder as a strategic rather than an activist investor.

Building up a block by purchasing shares from other large shareholders rather than via a tender offer may indicate that the goal of the acquirer is to extract private benefits at the expense of small investors (Burkart et al., 2000). Dispersed shareholders alone are unlikely to prevent the block holder from extracting excessive private benefits of control, whereas competition among large shareholders could serve this purpose (Bloch and Hege, 2001). A transaction that increases the ownership concentration (e.g. by means of merging some of the blocks) may result in erosion of the relative voting power of dispersed shareholders, even if their nominal stake remains unchanged. The larger the damage to their voting power, and hence the higher the likelihood that a block holder would extract private benefits of control, the less favorably the market perceives a given transaction.

When a substantial percentage of equity is dispersed (as it often is the case in Poland), even a relatively small block may give control gains due to large absenteeism of shareholders at their annual general meetings, and due to the information disadvantages potential experienced by small shareholders (Crama et al., 2003). In firms with more dispersed ownership (i.e. the firms where a free float constitutes larger fraction of the equity outstanding) this problem becomes more severe, since the block holders' incentives to expropriate non-controlling (presumably small) shareholders are stronger (cf. Bennedsen and Wolfenzon, 2000). The agency conflict between small and large shareholders intensifies with the size of the free float and is most acute in companies with numerous atomistic shareholders (who can be expropriated).

Hypothesis 2.2 (Expropriation): *The stock market reaction to an announcement of a block transaction is negatively related to the size of the free float.*

Barclay and Holderness (1989) claim that a block trade can be a signal about the prospects of the firm. Under the assumption that block holders have access to superior information, the market infers that transactions in which a seller is ready to liquidate the

position at discount (relative to the market price) signal bad prospects. In contrast, transactions concluded at premium convey good news and trigger positive market reactions.

Hypothesis 2.3 (Superior Information): *Transactions concluded at a premium are followed by a positive abnormal stock performance, while those at a discount are followed by a negative one.*

2.3.2. Determinants of block premia

As noted by Grossman and Hart (1988), Bebchuk (1994), and Zwiebel (1995), the price paid for a significant fraction of voting rights may reflect the possibility of extracting private benefits of control by the transaction parties. The value of control rights may exceed the post-trade market price if the potential extraction of private benefits of control is high. Moreover, the block trade premium may understate the true value of the private benefits because the owner of the equity block incurs the following two costs: (i) liquidation of a large equity position may be costly; (ii) holding a large block of shares limits the possibilities of risk sharing attainable by portfolio diversification (Admati et al., 1994).

The premia calculated relative to the pre-transaction price reflect both shared benefits of control (e.g. expected improvement introduced by a block holder) and private benefits of control (Barclay and Holderness, 1992). After the announcement, the market accounts for the possible value creation due to changes in ownership structure. Therefore the difference between the post-trade share price and the price paid in the block transaction is more informative about private benefits of control (Barclay and Holderness, 1989).

Hypothesis 2.4 (Existence of Private Benefits of Control): *Acquiring a large fraction of control rights requires a premium above the post-trade market price.*

The intuition that the possibilities to extract benefits of control are positively related to the degree of voting power is commonly accepted in the literature (e.g. Barclay and Holderness, 1989, 1991; Zingales, 1994, 1995; Nicodano and Sembenelli, 2000). Opinions

diverge, however, on the exact functional form of the stipulated relationship. Zwiebel (1995) argues that private benefits of control are divisible and that their allocation depends on ownership structure.[6] A block entitling to 20% of votes in a company with widely dispersed ownership is very likely to award its holder with effective control over the company (Crama et al., 2003). A block of 25% in a company with a majority shareholder usually does not give its holder significant influence unless supermajority requirements are imposed. Hence, it is the relative rather than the absolute voting power of a given investor, which determines his ability to enjoy private benefits of control (Crespi and Renneboog, 2003). This implies that premia paid in block transactions should depend not only on the size of the block, but also on the initial and post-trade ownership structure characteristics. By this I do not only refer to the characteristics of the investors selling and acquiring stakes, but also to those of all the investors who may be pivotal in a voting game (Crama et al., 2003).

Hypothesis 2.5 (Relative Power): *The premium an investor is ready to pay for the block positively relates to the relative power of a given block holder.*

2.4. Methodology

Since the publication of Manne's (1965) paper, corporate control is widely recognized in the financial literature as a major corporate asset. Therefore, it is evident that significant changes in ownership structure, and thus in control, constitute a major corporate event (Barclay and Holderness, 1989; Burkart et al., 2000). If semi-strong market efficiency is imposed, the impact of such an event should immediately be reflected in an appropriate stock price movement.[7] The analysis of block transactions and their perception enables me also to assess the importance of private benefits of control and draw indirect inferences about agency

[6] More specifically, it depends on the allocation of voting rights among various shareholders. This distinction is crucial for the companies with dual class stocks (carrying different voting rights).

[7] I assume that the news about block transactions is publicly available information. The plausibility of this assumption might be questioned in the markets characterized by relatively lenient disclosure requirements.

costs emerging from the interaction of shareholders. Thus, in testing for hypotheses developed in Section 2.3, event study methodology is applied (as do Barclay and Holderness, 1989, 1991; Keim and Madhavan, 1996; Banerjee et al., 1997).

Day 0 signifies the trading day following the block transaction, because all the block trades analyzed occurred and were announced after the closing of the downstairs market.[8] The estimation period spans 100 trading days. It ends one month before the event, i.e. the window [-121, -22] is used. Such a procedure is appropriate in the analysis of a young market characterized by highly volatile betas. It assures that estimates for the parameters of the benchmark model are not influenced by the event itself (Banerjee et al., 1997). Therefore, it should render reliable and relevant parameter estimates without imposing too rigid data availability requirements (which could result in survivorship bias). The returns are calculated in logarithmic terms, and so conform better than simple ones to the assumptions of the standard statistical techniques (Strong, 1992).

In order to analyze the announcement effect, I assume the event window to be the interval [0, 1] instead of analyzing just abnormal performance on day 0.[9] Such an approach allows for controlling for possible slow reaction of the market, e.g. due to thin trading (MacKinlay, 1997). I employ CAR(0, 1) as the dependent variable in the regression models estimated to test Hypotheses 2.1-2.3.

As a benchmark expected return, I employ the market model, which has been shown to outperform alternative specifications (Brown and Warner, 1985). The parameters of the model are estimated by OLS, where the returns on WIG[10] are taken as a proxy for market returns. Abnormal return on security i on day τ is then defined as the prediction error from the market model. Cumulative abnormal returns (CARs) over the interval $[\tau_1, \tau_2]$ are defined as

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[8] This is the rule in Poland: it aims to protect less informed traders. In most cases, day 0 is the press day (i.e. the day on which the information about the transaction is made public).

[9] Sensitivity checks indicate that the conclusions are robust to alternative definitions of the event window.

[10] WIG is a value-weighted index of the Warsaw Stock Exchange. It is the broadest of the Polish stock indices (it includes all the companies listed on the primary market).

the appropriate sums of abnormal returns (ARs), while average abnormal return (AAR) on day τ and cumulative average abnormal return (CAAR) over the period $[\tau_1, \tau_2]$ are computed as cross-sectional arithmetic means of the relevant ARs and CARs. The basic procedure employed for testing significance of CARs is a t-test. In the following analyses, I also use a Wilcoxon signed rank test in order to verify the robustness of the conclusions (MacKinlay, 1997).

Several measures of the level of premia can be found in the literature. The simplest one is the pre-trade premium defined as:

$$PREMIUM_i = \frac{p_{bi} - p_{mi}}{p_{mi}}, \tag{2.1}$$

where p_{bi} denotes the price (per share) paid in the i-th block transaction, and p_{mi} is the open market share price before the trade. Analogously to Barclay and Holderness (1989), for p_{mi} I take the market price on day (-3). A more appropriate way to estimate private benefits of control requires an analysis of standardized block premia.[11] They are calculated according to the formula:

$$STD\_PREMIUM_i = PREMIUM_i \cdot \alpha_i, \tag{2.2}$$

where α_i denotes the fraction of voting rights being transferred in the i-th block trade (Barclay and Holderness, 1989).[12] A post-trade premium and a standardized post-trade premium (*POST_PREMIUM* and *STD_POST_PREMIUM*) are two other measures of block premia. They are calculated in a similar way as *PREMIUM* and *STD_PREMIUM* but use the post-

[11] Standardized pre-trade premium is employed to test the *Superior Information Hypothesis*.

[12] In most of the cases it is equivalent to the fraction of voting equity being transferred. However, the sample analyzed contains some companies that issued preferred stock. Such stocks have superior voting rights, i.e. they give their bearer the right to exercise more than one vote per share (in my sample – from two up to five, depending on the company). None of the analyzed block trades involved a transfer of preferred stock. Transfer of such equity is very rare in Poland. Furthermore, only common stocks can be traded on the Warsaw Stock Exchange. Transfer of preferred stocks in listed companies requires the permission of the Securities and Exchanges Commission (KPWiG) and is arranged outside the regulated market.

trade price (i.e. the market price on day 0) as p_{mi}. Barclay and Holderness (1991) claim that such premia can be used to construct even more accurate measures of private benefits of control, since they capture the surplus paid above the price which the market perceives to be the fair value of the security after the block trade. I test for significance of post-trade premia and standardized post-trade premia in order to verify Hypothesis 2.4. Moreover, cross-sectional regression models explaining post-trade premia are estimated to test for the *Relative Power Hypothesis*.

All the regression models are estimated by OLS. I control for possible heteroskedasticity of an unknown form by employing White (1980) heteroskedasticity consistent estimators of the covariance matrix.[13] In all the regressions, I check for potential multicollinearity. The procedure employed involves the analysis of Variance Inflation Ratios (VIFs hereafter, Neter et al., 1996). A model is abandoned due to the collinearity problem if tolerance level of at least one VIF is lower than 10%. All the models reported are free of collinearity problems.

2.5. Data

2.5.1. Data collection

In order to obtain a sample of block trades in Polish listed companies, the archives of *Parkiet* and *Gazeta Wyborcza* are examined.[14] These are the most important newspapers providing information on the Polish stock market. In Poland, not all block transactions (even those involving parties that control more than 5% of votes) have to be publicly disclosed and it is therefore not possible to obtain the equivalent of the American SEC 13d filing. Moreover,

[13] In models explaining abnormal stock performance, it can be expected that the heteroskedasticity stems from cross-sectional differences in variance of the returns. I attempted to model it explicitly and re-estimated Models 2.1 and 2.2 by Weighted Least Squares. The results (not reported) are comparable to those obtained from OLS (see Table 2.4).

[14] *Parkiet* is an official newspaper of the Warsaw Stock Exchange. *Gazeta Wyborcza* is the largest Polish daily newspaper.

due to the small size of the Polish market, analysts' coverage is much worse than e.g. in the US. Thus, I use press data about block trading.

The sample period spans 44 months: from July 1996 until February 2000. Data for the first half of 1996 and earlier years are not available. The initial sample consists of 146 observations. Some observations had to be excluded from the preliminary sample for the following reasons:

- It is not possible to identify at least one of the parties to the transaction.
- Data is unreliable or erroneous.[15]
- The transaction is a response to a tender offer. Following Barclay and Holderness (1991), I exclude such transactions from the sample, since the marginal influence of a particular deal on the ownership structure is then difficult to measure. However, I do not exclude transactions which led to subsequent tender offers.[16]
- The transaction is tied with some other transactions agreed upon or revealed on the same (or very close) date, or more than one deal occurred in the event window. In such cases difficulties in disentangling events occurs.
- The transaction occurs between a company and its subsidiary or among subsidiaries of the same mother-company. In such a case block transaction price may not be very informative (e.g. the transaction may serve as a device of transferring profits within a corporate group).
- One of the transaction parties is a subsidiary of the company whose shares are traded. If such a company acts as a buyer - the deal resembles a share buy-back. If it acts as a

[15] In two cases, the reported fraction of shares held by all block holders exceeded 100%.

[16] Excluding such transactions would diminish sample size substantially. The reason for that is that a shareholder who accumulates at least 10% of shares of a company within 90 days is legally obliged to bid for the rest of outstanding shares. Exceptions are the situations when State Treasury is the block seller, or when the transaction concerns preferred stock (and thus is carried out outside the regulated market). An extensive discussion of the relationship between block transactions and subsequent tender offers can be found in Section 2.8.1.

seller, the transaction is either some kind of seasoned equity offering, or an anti-takeover mechanism to prevent a hostile takeover.[17]

As a result, 53 block trades remain in the final sample. The variables characterizing ownership structure before and after a transaction are constructed on the basis of the *Parkiet* ownership-structure database and the same sources, which are used to retrieve transaction details. The ownership-structure database is also used to collect data concerning the number of shares outstanding in the company. Stock prices and stock index values are downloaded from the website of the Bank of Environment Protection brokerage house (Bank Ochrony Srodowiska). The stock prices are dividend- and split-adjusted. All accounting data come from the *Notoria Serwis* databases.

2.5.2. Variable description

The sample covers firms from various industries. As illustrated by Table 2.1, most of the analyzed transactions occur in industrial and financial firms (43.40% and 37.74%, respectively), while almost one fifth of the sample firms can be classified as trade and service companies. At the two-digit classification level, banking is the most frequently represented industry with 14 observations (out of 53), followed by electric and machine industry (8 cases), food industry (7 cases), and construction (6 cases). This diversity assures that the results of the analysis are not driven by few industry-specific effects. Consequently, the conclusions drawn are not restricted to any particular industry.

In order to verify the *Restructuring Hypothesis*, *NEW_INVESTOR* and *STRATEGIC* variables are employed as regressors in the models explaining block transaction announcement effects. *NEW_INVESTOR* is a dummy variable equal to 1 when the block

[17] Sale of shares to a friendly party can play this role since in Poland subsidiaries cannot exercise their voting rights in the mother company (although they are residual claimants and have dividend rights).

Table 2.1. Industry classification for the sample firms.

Classification	No. of observations	Percentage
Industry:	**23**	**43.40%**
Chemical	4	7.55%
Timber and paper	1	1.89%
Electric and machine	8	15.09%
Textile	1	1.89%
Construction materials	2	3.77%
Food	7	13.21%
Trade and services:	**10**	**18.87%**
Construction	6	11.32%
Wholesale and retail trade	1	1.89%
IT	2	3.77%
Other services	1	1.89%
Financial services:	**20**	**37.74%**
Banking	14	26.42%
Insurance	5	9.43%
Financial services	1	1.89%
Total	**53**	**100.00%**

Note to Table 2.1: Industry classification is based on the Polish Classification of Economic Activity (PKD), which is consistent with the NACE Statistical Classification used by the European Union.

The *STRATEGIC* dummy variable equals one when the block acquirer is a strategic investor in the firm (which happens in more than 61% of the sample cases, see Table 2.2). In Poland, an investor can be granted such a status by the government (in case of privatizations) or by the target firm's board of directors. In return for certain privileges (e.g. negotiable share price or the option to increase the stake in the target firm via private equity placement), strategic investors are obliged to commit to restructuring the target firm. The scope of commitment and the associated privileges are negotiated between the investor and the board (or the State, in case of privatizations) on case-by-case basis.

I use the *FREE_FLOAT* variable to test for the *Expropriation Hypothesis*. It is defined as the fraction of voting rights not held by block holders. Table 2.2 illustrates that ownership dispersion in Poland is not very large. In a typical sample company, the *FREE_FLOAT* is quite low as the block holders control more than two thirds of the equity outstanding (or, more

Table 2.2. Descriptive statistics of the analyzed variables.

Variable	Mean	Median	Std. dev.	Minimum	Maximum
% OF VOTES	12.350	9.830	9.588	2.250	52.100
% OF CAPITAL	12.770	9.880	9.507	2.380	52.100
PREMIUM	9.085	10.556	19.232	-33.571	42.453
STD_PREMIUM	1.300	0.835	3.096	-6.384	8.509
POST_PREMIUM	6.803	9.013	17.906	-31.618	42.222
STD_POST_PREMIUM	0.984	0.631	2.722	-4.754	8.837
STRATEGIC	0.612	1	0.492	0	1
NEW_INVESTOR	0.302	0	0.463	0	1
FREE_FLOAT	32.582	29.580	16.530	1.660	73.250
OSV_SELLER (BEFORE)	0.171	0.098	0.232	0.000	1.000
OSV_SELLER (AFTER)	0.055	0.000	0.196	0.000	1.000
OSV_BUYER (BEFORE)	0.225	0.100	0.289	0.000	1.000
OSV_BUYER (AFTER)	0.406	0.246	0.362	0.000	1.000
ΔOSV_SELLER	-0.117	-0.087	0.159	-1.000	0.000
ΔOSV_BUYER	0.181	0.108	0.226	0.000	1.000
PRIVATIZATION	0.170	0	0.379	0	1
PROFITABILITY	-0.203	0.000	4.953	-10.268	20.129
LEVERAGE	39.466	40.794	17.331	11.195	83.687
FIRM_SIZE	5.238	4.656	1.760	1.993	8.859
RISK	3.123	2.993	0.765	1.588	5.081

Note to Table 2.2: *% OF VOTES* and *% OF CAPITAL* denote the percentage of voting rights and of cash flow rights transferred in a transaction, respectively. *PREMIUM* and *STD_PREMIUM* denote simple and standardized block premia (in %), respectively. *POST_PREMIUM* and *STD_POST_PREMIUM* are simple and standardized post-trade premia (in %), respectively. *STRATEGIC* is a dummy variable equal to 1 in cases where the block buyer is a strategic investor in a target company. *NEW_INVESTOR* is a dummy variable equal to 1 in cases where the block buyer is a new shareholder to the target company. *FREE_FLOAT* is expressed in percentage terms and denotes the fraction of voting rights not held by block holders. *OSV_SELLER (BEFORE)* and *OSV_SELLER (AFTER)* denote pre- and post-trade oceanic Shapley values for the seller, respectively. *OSV_BUYER (BEFORE)* and *OSV_BUYER (AFTER)* denote pre- and post-trade oceanic Shapley values for the buyer, respectively. *ΔOSV_SELLER* and *ΔOSV_BUYER* are the changes in the seller's and buyer's oceanic Shapley values, respectively. The *PRIVATIZATION* dummy equals one for the transactions where the State Treasury is a block seller. *PROFITABILITY* is expressed in percentage terms and proxied by (2-digit-industry median-adjusted) return on assets (measured at the end of the quarter preceding the transaction; the variable is defined only for non-insurance companies). *LEVERAGE* (only for non-financial companies) is expressed in percentage terms and is proxied by the ratio of the value of debt to the value of the total assets (measured at the end of the quarter preceding the transaction). *FIRM_SIZE* is measured as a natural logarithm of market capitalization (expressed in millions PLN). Market capitalization is computed as the product of the number of the shares outstanding and the share price on the day preceding a block transaction. *RISK* (expressed in percentage terms) denotes standard deviation of daily stock returns in the estimation period.

precisely, of the voting rights). Sample companies differ considerably in this respect, however.

Relative power of block holders and of the dispersed shareholders is measured by oceanic Shapley values (Milnor and Shapley, 1978). The notion of oceanic Shapley value (OSV, hereafter) generalizes the concept of Shapley values used in the analyses of finite games (Shapley and Shubik, 1954). An implicit assumption in computing OSVs is that the dispersed shareholders (sometimes referred to as the ocean) take part in the voting game, though it may not be easy for them to coordinate.[18] This feature seems quite plausible in the analyzed context.

By definition, the (oceanic) Shapley value of an investor equals the probability that he is pivotal in a randomly formed coalition of investors. Consequently, it not only depends on the size of the stake controlled by a given shareholder, but it also takes into account the dispersion of all the stakes.[19] This feature advocates the appropriateness of OSVs for testing the *Relative Power Hypothesis.* In the regressions explaining block premia, the changes of the buyer's and the seller's OSVs measure the impact of a particular block transaction on parties' strategic strength. Moreover, the pre-trade seller's OSV and the post-trade buyer's OSV are meant to capture the power of respective parties in bargaining over the premium level. Table 2.2 indicates that block buyers are usually more powerful than block sellers, already before a transaction. Notably, the changes in buyers' and sellers' relative strength are not mirror images of each other: the average buyer's gain (as measured by *ΔOSV_BUYER*) is more than

[18] Provided that absenteeism of small investors at the shareholders' meetings is a rule rather than an exception, the approach suggested by Crespi and Renneboog (2003) is justified. They argue that dispersed shareholders are too small to participate in the voting game (due to e.g. costs of gathering the information, attending shareholders' meetings, etc.) and therefore their role in exerting corporate control is negligible. Consequently, stakes controlled by block holders are re-scaled to sum up to 1. Then, regular Shapley values are computed for the finite game obtained (Shapley and Shubik, 1954). Applying this approach, my results are qualitatively comparable to those in the regressions reported below. The model fit is usually somewhat weaker.

[19] The stakes are always computed on the basis of voting rights controlled by a given investor. Therefore, in some cases they do not coincide with the fraction of cash flow rights (measured by the fraction of shares held) that characterize those stakes.

1.5 times the seller's average loss (*ΔOSV_SELLER*). As a result, a typical block transaction considerably enhances the relative strength of the block acquirer vis-à-vis other shareholders.

In the models explaining stock market reactions to the announcements of block transactions, I include the *PRIVATIZATION* control dummy variable. It equals one if the State Treasury is the seller (i.e. for 9 transactions in the sample), and zero otherwise. This variable allows for differences in motives driving privatization decisions and other block sales (Cornelli and Li, 1997). Moreover, in the sensitivity analyses, I employ *PROFITABILITY* (defined as the industry median-adjusted return on assets), *LEVERAGE* (proxied by the ratio of the value of debt to the value of total assets), and the size of the block (measured by *ΔOSV_BUYER*, *ΔOSV_SELLER*, or *% OF VOTES*) as additional control variables. Shareholder activism may be more beneficial in underperforming firms (Bethel et al., 1998).[20] Higher indebtedness of the target firm constrains access to free cash flows, making expropriation difficult (Banerjee et al., 1997). Moreover, highly leveraged firms should also benefit more from direct or indirect decreases in expected bankruptcy costs provided by the new stakeholder. Finally, it might be the case that market reaction to larger block transactions is more pronounced than to smaller ones. Therefore, I investigate such a possibility in the sensitivity analyses.

Several control variables are included in the models explaining the level of block premia as well. Nicodano and Sembenelii (2000) indicate that idiosyncratic firm characteristics can influence the value of control rights in a company. Unfortunately, the small size of the sample does not allow me to control for industry-specific effects. I do include, however, variables capturing company profitability, risk, and size. Dyck and Zingales (2004) argue that a troubled company may inflict a loss in reputation to the controlling party and, in

[20] Table 2.2 documents that the sample includes both firms that under- and overperformed their industry peer group.

extreme cases, even some legal liabilities. Hence, the value of control may be lower in underperforming firms. I include the *PROFITABILITY* variable to control for such a possibility. Company risk is proxied by the standard deviation of percentage daily returns on a company's stock within the estimation period. Inclusion of the *RISK* variable is motivated by Demsetz and Lehn (1985) who argue that monitoring by a large shareholder increases in value, and hence concentrated ownership will be more likely, as the company's risk increases.

Barclay and Holderness (1989) suggest that block holders in larger firms enjoy greater pecuniary and non-pecuniary benefits. However, the cost of holding a block is higher for large companies (Franks et al., 2001). The reasons for that may be the costs of financing the block or an excessive imperfectly diversifiable risk (Nenova, 2003). If the market is not deep enough (in the sense of Kyle, 1985), it might be difficult for a block holder to liquidate a very big position. Finally, large companies are usually subject to more extensive tracking by analysts and monitors, which makes the extraction of private benefits of control more difficult. The *FIRM_SIZE* variable (defined as the natural logarithm of market capitalization expressed in millions PLN) is meant to control for those effects. As illustrated by Table 2.2, sample firms differ considerably as far as their size is concerned: the largest sample firm is approximately 960 larger than the smallest one.

In a sensitivity analysis, I use *LEVERAGE* as a control variable in the models explaining the block premia. High levels of debt might both increase and reduce control rents (Nicodano and Sembenelli, 2000). Increasing the leverage has a twofold effect. On the one hand, it can increase the size of the company, and thus help to overcome the owners' wealth constraints (Stulz, 1988). On the other hand, it can constrain managerial discretion by restrictive covenants, and by the obligation to pay out future cash flows (Harris and Raviv, 1988), which reduces the possibility of extracting perquisites of control.

Block holders' characteristics might affect the investors' ability to extract private benefits of control.[21] In order to control for the possible heterogeneity of block acquirers, I employ the *STRATEGIC* dummy in sensitivity analyses. There is no reason to assume that all the sellers in block transactions are homogeneous either. They can also pursue various goals. For instance, when the State Treasury is selling its stake in a formerly state-owned company it possibly takes into account factors other than obtaining the maximal possible price for the block. It may follow the criterion of maximizing incumbent stakeholders' interests (which could mean, e.g. sustaining employment) rather than obtaining the highest price (Cornelli and Li, 1997). Therefore, I include the *PRIVATIZATION* dummy in the sensitivity tests as well.

2.6. Valuation effects of block transactions

Table 2.3 supports the claim that a block transaction is a major corporate event that leads to significantly positive abnormal stock performance around the announcement date. An average (median) company outperformed the benchmark by 1.158% (1.115%) over the two-day announcement period. Therefore, the event study results support the *Restructuring Hypothesis* postulating that expected improvement of corporate governance is induced by a transfer of control. No support for the *Superior Information Hypothesis* is found: the block transactions concluded at a premium are not perceived better than those concluded at a discount (in fact, Table 2.3 documents the reverse).

Table 2.4 reports the regression models explaining the valuation effects of block transactions. The stock market perceives a block transaction more favorably if the buyer is a strategic investor in the target company. For such transactions CAR(0, 1) exceeds that for

[21] Shleifer and Vishny (1997) give a Russian example of such differences. They point out that a Western investor can control a Russian company with 75 percent ownership, whereas a Russian investor can do so with only 25 percent stake. Although in other markets, legal protection of all investors is usually (more) equal, the discrepancies can emerge due to differences in monitoring abilities of different shareholders. Moreover, some of the private benefits of control (e.g. synergies) can be enjoyed only by a particular group of investors.

Table 2.3. Announcement effects of block transactions.

	CAAR(0, 1)	Median CAR(0, 1)	t-statistics	Wilcoxon statistics	No. of observations
Full sample	1.158%	1.115%	1.899 *	2.058 *	53
Transactions at premium	1.123%	1.033%	1.665 †	1.335 †	36
Transactions at discount	1.233%	2.079%	2.660 **	1.870 *	17

Note to Table 2.3: Cumulative average abnormal returns are computed as prediction errors from the market model. †, *, and ** denote significance at 10, 5, and 1% level, respectively (for one-tailed tests).

Table 2.4. Models explaining announcement effects of block transactions.

Variable	Model 2.1	Model 2.2
INTERCEPT	2.263	2.261
	(1.37)	(1.36)
STRATEGIC	2.780	2.793
	(2.03) *	(2.07) *
NEW_INVESTOR	2.314	2.320
	(1.77) †	(1.78) †
FREE_FLOAT	-0.079	-0.078
	(-2.15) *	(-2.11) *
PREMIUM		-0.002
		(-0.11)
PRIVATIZATION	-4.442	-4.437
	(-2.98) **	(-2.94) **
No. of observations	49	49
R^2	0.311	0.311
F-statistic	5.21 **	4.48 **

Note to Table 2.4: OLS estimates are reported in the table. Heteroskedasticity-consistent t-values are provided in parentheses. †, *, and ** denote significance at 10, 5, and 1% level, respectively (for two-tailed tests). The dependent variable in all models is CAR(0, 1). *STRATEGIC* is a dummy variable equal to 1 in cases where the block buyer is a strategic investor in a target company. *NEW_INVESTOR* is a dummy variable equal to 1 in cases where the block buyer is a new shareholder to the target company. *FREE_FLOAT* is expressed in percentage terms and denotes the fraction of voting rights not held by block holders. *PREMIUM* denotes simple (pre-trade) block premium. The *PRIVATIZATION* dummy equals one for the transactions where the State Treasury is a block seller.

other deals by almost 2.8 percentage points. Entries by new block holders are also welcomed by the stock market. Abnormal returns for such deals are approximately 2.3 percentage points higher than for other block transactions. If the block acquirer appears to be capable to implement value increasing measures in target firms and to be committed to do so, investors

perceive the transaction significantly more favorably. This result supports firmly the *Restructuring Hypothesis.*

Investors expect that block acquirers' activism benefits the firm value. Still, the shareholders seem to worry that when the acquirers' control power is unlikely to be challenged, the expropriation threat is more credible. In such cases, accumulating even a small block may provide its holder with effective control. The announcement effect of a block transaction (i.e. CAR(0, 1)) and the size of the free float are negatively related. In the firms where the free float constitutes a larger fraction of the equity outstanding (and, therefore, the scope for expropriation is bigger), block transfers are perceived less favorably. Since this effect is economically[22] and statistically significant, Models 2.1 and 2.2 provide some support for the *Expropriation Hypothesis*. The apparent concern of the Polish market about possible expropriation of small investors is in line with the findings of La Porta et al. (1998). They document inferior minority shareholders' protection in the non-Anglo-American corporate governance systems.

The *Superior Information Hypothesis* postulates that the level of the block premia signals the prospects of the firm. However, Model 2.2 refutes the claim that the market reacts to such a signal: the relationship between the block trade announcement effect and the level of the premia is insignificant.[23] Hence, the *Superior Information Hypothesis* is rejected.

The signs corresponding to the *PRIVATIZATION* dummy are negative. Privatizations are not favorably received by the market (relative to other block transactions). This seems counterintuitive for two reasons. In (partly) state owned companies, management can be subject to political pressures. Additionally, the State's objectives may be different from profit maximization. For instance, the State could stimulate to maintain employment at too high

[22] For instance, an increase of the *FREE_FLOAT* variable by one standard deviation (16.53%) on average lowers the abnormal return on the announcement of a block transaction by about 1.3 percentage points.

[23] This result is upheld when a standardized premium is used instead of a simple one.

levels (Cornelli and Li, 1997). Consequently, privatizations are expected to result in efficiency gains (Aghion and Blanchard, 1998). If a transfer of control from a public to a private owner is to improve company performance, it should be perceived more favorably (or at least not less favorably) than a block transaction agreed on by private investors. This claim seems doubtful in the light of my results. Possibly, additional covenants included in privatization deals (e.g. a requirement of sustaining the level of employment, or imposing some investment obligations) are suboptimal from the investors' point of view, making such block acquisitions less attractive. Furthermore, shareholder activism by the State may bring about benefits for the dispersed shareholders.[24] For instance, the presence of the State in the ownership structure may limit opportunities for other block holders to extract private benefits of control.

2.7. Determinants of block premia

The levels of block premia can be used to estimate the value of private benefits of control. Hypothesis 2.4 postulates that substantial blocks of shares provide opportunities to extract private benefits of control. That is why the acquisition of a block occurs at a premium over the market price. The data support this hypothesis (see Table 2.2). Both simple and standardized post-trade premia significantly exceed zero. Relevant t-statistics equal 2.766 and 2.633, respectively, which corresponds to a significance level of approximately 1%. The distribution of premia is illustrated by Figures 2.1 and 2.2.[25]

The relatively low level of observed block premia in the Polish market is striking. The average of 0.98% falls in the lower end of the estimate ranges reported by Nenova (2003) or

[24] Under sufficiently weak corporate governance, partial state ownership may be superior to some other types of ownership to stimulate corporate restructuring (Djankov and Murrell, 2002).

[25] When I limit the analysis to companies following the one-share-one-vote rule, the results for this sub-sample of 39 observations (not reported) are very similar to the ones obtained for the whole sample. Hence, I argue that the presence of companies issuing preferred stock in the sample does not affect the conclusions.

Figure 2.1. Post-trade block premia.

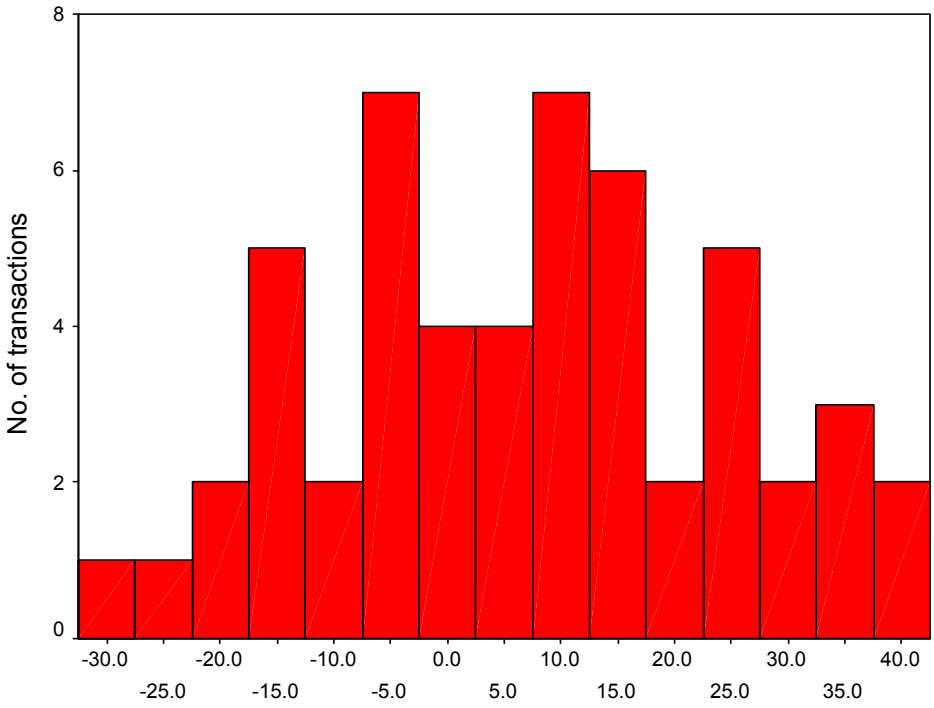

Figure 2.2. Post-trade standardized block premia.

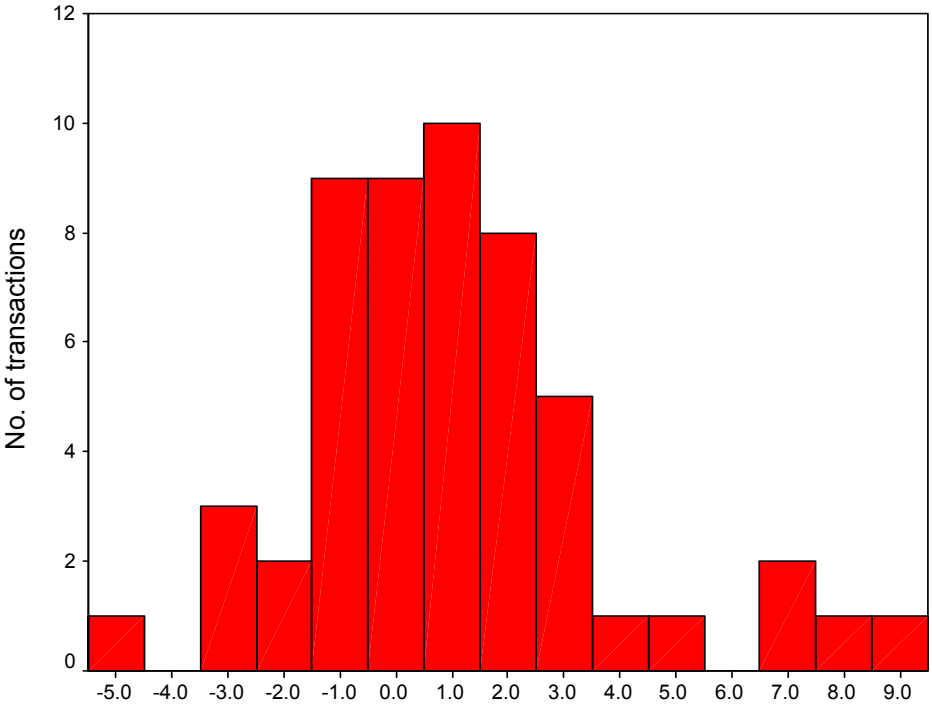

Table 2.5. Models explaining block premia.

Variable	Model 2.3	Model 2.4	Model 2.5	Model 2.6
INTERCEPT	2.553 (0.23)	2.509 (0.22)	1.668 (0.15)	-0.756 (-0.06)
ΔOSV_SELLER	-16.875 (-1.77) †			
ΔOSV_BUYER		7.091 (0.89)		
OSV_SELLER (BEFORE)			12.069 (1.83) †	
OSV_BUYER (AFTER)				12.892 (2.13) *
RISK	8.171 (2.79) **	8.052 (2.73) **	8.078 (2.85) **	8.129 (2.63) *
FIRM_SIZE	-4.583 (-3.93) ***	-4.364 (-3.80) ***	-4.387 (-3.83) ***	-4.469 (-3.73) ***
PROFITABILITY	0.123 (0.26)	0.119 (0.26)	0.119 (0.26)	0.146 (0.34)
No. of observations	47	47	47	47
R^2 F-statistic	0.313 7.44 ***	0.298 8.21 ***	0.318 9.87 ***	0.356 11.06 ***

Note to Table 2.5: OLS estimates are reported in the table. Heteroskedasticity-consistent t-values are provided in parentheses. †, *, **, and *** denote significance at 10, 5, 1, and 0.1% level, respectively (for two-tailed tests). The dependent variable in all models is standardized post-trade premium (in %). *ΔOSV_BUYER* and *ΔOSV_SELLER* are changes in the buyer's and seller's oceanic Shapley values, respectively. *OSV_SELLER (BEFORE)* and *OSV_BUYER (AFTER)* denote oceanic Shapley values for the seller (pre-trade) and for the buyer (post-trade), respectively. *RISK* denotes the standard deviation of daily stock returns in the estimation period. *FIRM_SIZE* is measured as a natural logarithm of market capitalization (expressed in millions PLN). *PROFITABILITY* is proxied by (2-digit-industry median-adjusted) return on assets.

Dyck and Zingales (2004) for various countries.[26] Moreover, every third transaction in the sample analyzed here involves a discount rather than a premium. The claim that private benefits of control in Poland are comparably low to those in the most developed market economies characterized by good investor protection seems implausible. An alternative explanation may be the presence of liquidity costs faced by block holders in Poland. Some evidence for this argument follows also from the regressions below.

[26] The latter paper estimates private benefits of control in Poland to constitute about 11% of the market value of equity. This result is based on just four block transactions.

The standardized post-trade premium has an intuitive interpretation, i.e. the value of private benefits as a percentage of the total value of the firm's equity (Barclay and Holderness, 1989). However, in the regression models summarized in Table 2.5, I employ the simple post-trade premium as a dependent variable, because the models explaining the standardized premium could suffer from endogeneity problems.[27] The standardization involves scaling the simple premium by the size of the block, while some of the regressors (i.e. OSVs and their changes) are actually functions of the size as well.[28]

In line with the *Relative Power Hypothesis*, larger incremental changes of the strategic importance of block transaction parties are related to larger premia. In Models 2.3 and 2.4, the coefficients corresponding to the changes of OSV for the seller and for the buyer have the expected signs and the former one is marginally significant.[29] Model 2.5 tends to indicate that larger sellers with strong voting power (as measured by the respective OSV) are able to obtain higher premia for the blocks sold. Again, the corresponding coefficient is marginally significant. According to Model 2.6, the larger the post-trade relative power of the buyer, the higher is the block premium paid. The coefficient corresponding to the post-trade OSV of the buyer is significantly positive. The *Relative Power Hypothesis* is therefore supported. The relative power of block holders determines the level of block premia and the ownership structure seem to affect the opportunities of extracting private benefits of control.

RISK emerges as another variable that has a significant impact on private benefits of control. Apparently, control is more valuable in riskier firms. This result is consistent with option-like character of equity. The estimate corresponding to the *FIRM_SIZE* variable

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[27] I would like to thank an anonymous referee for pointing out this problem.

[28] Barclay and Holderness (1989) argue that the standardized post-trade premia have better statistical properties than the simple post-trade premia. Therefore, despite the concerns raised above, I estimated the models with the standardized post-trade premium as a dependent variable. The results (not reported) are virtually identical to those presented in Table 2.5.

[29] The change of the seller's OSV is a non-positive number. Hence, the corresponding coefficient is expected to be negative.

persists to be negative and highly significant across all four specifications. This result suggests that, in Poland, the liquidity costs in the market for blocks may be of some importance. The costs associated with holding a large block (in value terms) appear large enough to outweigh the positive impact of a company's size on the value of private benefits of control hypothesized by other studies.

My results seem to confirm the positive relationship between firm performance and the value of control postulated by Dyck and Zingales (2004). The estimated effect of the *PROFITABILITY* variable is positive (although insignificant) across Models 2.3-2.6. It appears that the possibilities to extract private benefits of control in well-performing companies are higher than in those that do worse.

2.8. Additional analyses and robustness tests

2.8.1. Block transfers and the anticipation of a takeover

Arguably, a positive reaction to a block transfer and the support for the *Restructuring Hypothesis* may stem from the anticipation of takeover rather than from the expected restructuring and the increased monitoring by the block acquirer.[30] Although in about 30% of the cases analyzed here, a tender offer was made within a year from a block transaction (in 6 cases, a sample company was merged or delisted within this period), I argue that this takeover-threat argument cannot fully explain my results. I document that – even in the absence of a credible takeover threat – the shareholders can benefit from a substantial change in the firm ownership structure.

First, if the favorable reaction to block acquisitions by strategic investors and by investors new to the company was due to the anticipation of a takeover, those variables should have predictive power in explaining the likelihood of tender offers following such a block acquisition. It is not the case, however. I estimated logit models (not reported) where the dependent binary variable equals 1 for firms where tender offer was announced within a year

[30] I would like to thank an anonymous referee for raising this issue.

from the block transactions and 0 otherwise. As the regressors, I employed the variables used in Section 2.6 to explain the announcement effects. Those models fare quite poorly in explaining the likelihood of a tender offer – in virtually all cases, the model coefficients are not jointly significant at conventional confidence levels. In particular, neither the *NEW_INVESTOR* nor the *STRATEGIC* variable reaches a generous 10% significance level in any of the specifications tried.[31] Consequently, I argue that those variables are unlikely to capture the effects of an anticipated takeover.

Second, I carried out an event study that analyzes operating performance of the sample firms over a period of one year after the block transfer occurred. I employ the return on assets as a measure of the operating performance. I follow the approach proposed by Barber and Lyon (1996) and compare the performance of the sample firms with the performance of a matching portfolio. I use industry and performance matching to construct the comparison group. Such a matching procedure renders reliable benchmarks even if sample firms performed unusually well or poorly in the pre-event period (Barber and Lyon, 1996). The firms constituting the industry comparison group meet two criteria. First, they are public firms belonging to the same industry (defined at the two-digit level) as the focal firm. Second, their operating performance (ROA) at the end of the last quarter before the block transaction lies within the range of the ROA of the focal firm ±0.75 within-industry standard deviation of ROA.[32]

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[31] In fact, the corresponding estimates are usually negative, which is inconsistent with the takeover anticipation argument discussed above.

[32] Due to the relatively small number of public firms, narrower bands used by Barber and Lyon (1996) render the industry comparison group to be empty in many cases. The approach proposed here assures a reasonably numerous groups (average and median portfolios consist of 12 firms, while 85% of those portfolios comprise at least 5 firms). Still, in one case, such a procedure renders the industry comparison group to be empty. For this observation, I adjust the matching procedure and define the comparison group as the two industry peers whose performance is closest to that of the focal firm (which effectively means imposing a band of ±1.75 within-industry standard deviation of ROA instead of a standard one). The results of the event study are not driven by this observation and are robust to its exclusion.

Barber and Lyon (1996) show that benchmarks that incorporate past performance of the focal firm yield well-specified and powerful test statistics. Moreover, they illustrate that change models dominate level models in detecting abnormal operating performance. Following these arguments, I define expected performance as the pre-event firm performance adjusted by the change in the median performance of the industry comparison group (as defined above). Abnormal performance is the difference between the focal firm's ROA at the end of the fourth full quarter after the block transaction and the benchmark. I use a Wilcoxon signed rank test and a t-test to verify statistical significance of this abnormal performance. Significance levels discussed below correspond to one-tailed tests.

The results document some improvement of the operating performance (ROA) over a period of one year after the block transfer. On average, the focal firms outperformed the benchmark by 1.104%, which is marginally significant (p-value for the t-test equals 0.077). The median abnormal ROA is also positive (0.727%), while Wilcoxon test indicates that abnormal performance of the sample firms significantly exceeds zero (p-value equals 0.030). The numbers, although not very large, suggest that even the firms that were not taken over recorded some improvement in their operating performance in the year following the block transaction.[33] Therefore, I argue that not only a completed takeover, but also an acquisition of a substantial block may benefit company shareholders.

Third, the anecdotal evidence (based on the extracts from financial press) suggests that some imprecise clauses in the Polish takeover law in the analyzed period resulted in an insufficient protection of the minority shareholders' interests. In particular, the requirement that '*the minimum price in a tender offer should only be based on a 6-month average price from a period preceding the offer and the right to accumulate the shares with the help of the* [acquirer's] *subsidiaries allowed for a legal violation of dispersed shareholders' interests. For instance, (...) it was possible to acquire 26% of shares of Polifarb Dębica for PLN 72 per*

[33] Obviously, the results of this event study are based on a non-takeover subsample only.

share in block transactions, and one week later offer PLN 57 per share in a tender.'[34] Consequently, in the analyzed period a tender mechanism could be used as a way of squeezing out minority shareholders. Therefore, the effect the anticipation of a tender offer (and a subsequent takeover) may have on a block transaction announcement is not unambiguous. This argument further undermines the takeover explanation for the results of Section 2.6 and exemplifies a particular kind of expropriation threat that may be experienced by minority shareholders.

2.8.2. Determinants of valuation effects: Other robustness checks

As a sensitivity check I examined the effects of the inclusion of *LEVERAGE* and of *PROFITABILITY* as additional control variables in Models 2.1-2.2 (Table 2.4). Neither of the two proves significant as a determinant of the transaction announcement effects, while none of the conjectures of the models summarized in Table 2.4 is seriously challenged. Also, the size of the block transferred does not influence the level of CAR(0, 1). The effect is insignificant, irrespectively of the proxy used to measure the block size (*ΔOSV_BUYER*, *ΔOSV_SELLER*, or *% OF VOTES*), while the conclusions of Models 2.1 and 2.2 are upheld.

I also checked whether the results summarized in Table 2.4 are not driven by a few influential observations. I winsorized the dependent variable (i.e. CAR(0, 1)) as well as both the continuous regressors from Models 2.1 and 2.2 (i.e. the *FREE_FLOAT* and *PREMIUM* variables). In each case, the winsorization procedure involved replacing the two highest and the two lowest values of a particular variable by the third largest and the third lowest values, respectively. Then, I re-estimated Models 2.1 and 2.2 using those transformed variables (rather than the actual ones). The significance levels were only slightly affected, while none of the earlier conclusions were challenged.

[34] It is a translation of a quote from a press article (Czy będą wzywać? *Parkiet,* December 7, 2000).

2.8.3. Determinants of block premia: Robustness checks

I performed some additional sensitivity tests for the models explaining the level of block premia that are reported in Table 2.5. When *LEVERAGE* is added as a regressor, the corresponding coefficient is negative (and statistically significant in some specifications), while the significance of some other estimates is affected (possibly due to a substantially decrease of the sample size). Still, the main qualitative conclusions of Models 2.3-2.6 remain upheld. I also attempt to control for the identities of the transaction parties, and added the *PRIVATIZATION* or *STRATEGIC* dummies to the model specifications discussed above. Block premia paid in privatizations are usually slightly higher, but neither of the two variables considered are consistently significant across model specifications. None of the major conclusions purporting to the other variables is materially different.

I also examined whether the results of Table 2.5 are not driven by outliers. Again, I winsorized the dependent variable (i.e. *POST_PREMIUM*) as well as all the regressors used in Models 2.3-2.6, according to the winsorization procedure discussed in Section 2.8.2. I re-estimated Models 2.3-2.6 with those winsorized variables. Only the significance of the *ΔOSV_SELLER* variable (in Model 2.3) decreased materially (the estimate remained negative, however), while the other results remained virtually intact. Thus, I conclude that despite a relatively small sample size, the presence of outliers does not pose a serious problem to the analyses carried out in Chapter 2.

2.9. Discussion and concluding remarks

Chapter 2 presents an empirical analysis of the Polish equity block market. Most of the previous studies examining block trades investigate the American stock market and the well-developed European markets. Hardly any empirical work has been performed to study these issues for the emerging markets of Central Europe. One of the main reasons is that these markets, including the Polish one, are young, which makes it impossible to track the companies in the longer period after block transactions.

The results show that the transfer of control rights that takes place in block trades in Poland constitutes a major corporate event, typically associated with positive abnormal stock performance. In line with the *Restructuring Hypothesis*, shareholders expect to benefit from intensified monitoring and from corporate restructuring resulting from block acquisitions. Block acquisitions by strategic investors and by shareholders who are new to target companies are perceived significantly more favorably by the market than other block transactions. A more direct evidence of beneficial restructuring is also provided: companies that experience a block transaction enjoy a statistically significant improvement of operating performance following such a change in the ownership structure.

Dispersed shareholders appear to be wary of the expropriation that could follow the extraction of private benefits of control by dominating block holders. Block transactions in firms with a larger free float (i.e. the companies where the scope for expropriation is bigger) are perceived less favorably, which supports the *Expropriation Hypothesis.* Hence, I argue that the costs of excessive ownership concentration may partly offset the benefits resulting from block holders' activism. This result brings about important policy implications, calling for improvement of corporate governance standards.

Although private benefits of control in Poland are likely to be large, the observed block premia turn out to be lower than those documented for most of the other countries. Apparently, the costs of holding equity blocks are substantial, possibly due to liquidity considerations. Hence, the value of corporate control in Poland tends to be relatively low, despite numerous deficiencies in corporate governance standards.[35] Still, the block premia detected in the sample are positive, which implies that controlling block holders of Polish companies can enjoy some private benefits of control.

The findings reject *Superior Information Hypothesis*: the level of block premia paid does not seem to convey information about a company's prospects. In line with the *Relative*

[35] In the analyzed period, Poland still lacked an appropriate legal framework and a code of practice. A new corporate law was adopted in 2001, while the Warsaw Stock Exchange approved a corporate governance code for listed companies in 2002.

Power Hypothesis, the level of block premia depends not only on the size of the block transferred, but also on the dispersion of voting rights. Oceanic Shapley values capture well the strategic importance of owners and their possibilities to extract private benefits of control. Incremental changes of the block holders' relative voting power influence the level of block premia. The larger the degree of control the buyer (seller) achieves (gives up), the higher the block premia paid.

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Chapter 3

The Managerial Labor Market and the Governance Role of Shareholder Control Structures

3.1. Introduction

Executive compensation remains one of the most widely discussed governance issues in the UK where it continues to attract the attention of the business community, academics, and the popular press. For instance, numerous calls for improving the code of good practice for managerial remuneration contracting and for stronger involvement of shareholders in the pay-setting process followed the dispute over the pay of the GlaxoSmithKline (GSK) executive Jean-Paul Garnier in 2003. The wave of comments in this shareholder revolt against corporate 'fat cats' voices the concerns of the investment community.

> *Companies must be free to run themselves as they think best and to pay their executives appropriately. But they must also act responsibly when company performance is poor. Shareholders must hold them to that responsibility, and ensure that the days of the overfed felines are numbered*.[1]

> *Never has executive pay been more in the limelight than it is now. While share prices languish deep in the doldrums after one of the worst bear markets on record, executive pay, pensions and perks are still apparently continuing to soar. It seems that barely a*

[1] *The Times.* May 20, 2003.

day passes without another company and another leading business figure featuring in newspaper headlines in a controversy over remuneration. Inevitably, the beneficiaries have been dubbed fat cats, and the real anger is over those with the most handsome remuneration packages who are presiding over companies which are hardly enjoying soaraway success.[2]

Apparently, the recommendations of the British governance committees did not have sufficient clout to curb the excesses in managerial compensation. One of the main deficiencies of widely-held public corporations – 'strong managers, weak owners', in the words of Roe (1994, 2002) – has led to the situation where the mechanisms meant to improve the governance standards like performance-related pay are misused by powerful directors to extract substantial rents from the companies they work for.

One of the really alarming aspects of global capitalism during the 1990s was the increasing disconnect between the managerial cadres who ran companies and shareholders who owned them. Managers and the boards that appointed them stopped seeing themselves as custodians of other people's money and became a self-serving interest group, dedicated to grabbing more of the cake.[3]

The early agency literature stipulates that shareholders' interests can be protected because managerial incentives can be (re)structured. As such, managers attempt to avoid poor performance due to the threat of dismissal and are stimulated to reach strong corporate performance as a result of the rewarding and incentive effects of compensation contracts (Holmström, 1982b; Murphy, 1986). The efficiency of these contractual alignment mechanisms, namely performance-related managerial remuneration and dismissal, remains an open research issue. Bebchuk and Fried (2003) cast doubt on the efficiency of remuneration contracting as an alignment mechanism; their 'managerial power model' points out that

[2] *The Independent.* May 20, 2003.

[3] *The Independent.* May 21, 2003.

executive compensation can be seen as a manifestation of agency problems rather than a solution if remuneration contracting is not embedded in a proper governance system. Bertrand and Mullainathan (2000, 2001) show US evidence that the performance-related contracts do not correct for windfall profits which are not related to managerial efforts or skill and that CEOs are hence paid for luck. Furthermore, they propose a model whereby 'agents without principals' (managers without a proper governance mechanisms like a monitoring block holder) are skimming corporate profits. This chapter makes several contributions to the literature: first, by providing empirical evidence on these two competing views (contractual alignment hypothesis versus the 'managerial power' or 'skimming' model).

Second, although a large body of academic literature exists (especially for the US) on both managerial disciplining and managerial compensation, these two aspects of the managerial labor market are usually – with the notable exception of Coughlan and Schmidt (1985) – treated separately. However, the two governance mechanisms in question are likely to be strongly linked such that the results of studies of executive turnover and of managerial remuneration in isolation are likely to be biased. Furthermore, each of these governance mechanisms only addresses agency problems for a specific range of performance levels. For instance, performance-sensitive managerial compensation contracts are only designed for average or high levels of performance because management may not be induced to generate further efforts when they realize that the minimal performance thresholds triggering bonuses are out of reach. Likewise, Jensen and Murphy (1990) argue that the probability of CEO dismissal is too low to align effectively the interests of managers and owners. Consequently, in order to cover a more complete spectrum of incentives, the carrot (performance-related compensation) and the stick (dismissal) need to be studied simultaneously. Simultaneous treatment of both governance mechanisms is econometrically translated into a Heckman sample selection model (type-2 Tobit). This technique mitigates the sample selection biases induced by sample endogeneity affecting many of the studies analyzing managerial

compensation. I document that my estimation technique yields unbiased results as opposed to fixed-effect panel data regressions.

Third, this chapter contributes to the research on the (relative) efficiency of various governance mechanisms. My models examine the impact of a set of governance mechanisms on turnover and the use of compensation: e.g. control concentration by type of shareholder, the market for share blocks, the structure of the internal control mechanism (board of directors) and leverage (as a bonding mechanism).

Finally, my results correct the findings of earlier UK research which did not find a relation between managerial remuneration and corporate performance (or found a very weak relation). The lack of performance sensitivity in earlier UK studies may result from the biases induced by in appropriate estimation methodologies or may be due to benchmarking problems. I study a wide set of industry-adjusted performance measures.

I analyze a randomly drawn sample of listed UK firms and obtain the following results for the analysis of CEO dismissal: (a) CEO replacement is strongly performance-sensitive. Top executive turnover is shown to serve as a disciplinary mechanism for corporate underperformance. (b) Neither total ownership concentration nor the presence of large block holdings held by outsider shareholders (institutions, families or individuals, other corporations) is related to higher CEO turnover even in the wake of poor performance. This implies that there is little evidence of shareholder monitoring. (c) CEOs with strong voting power successfully impede replacement, irrespectively of corporate performance. This case of strong managerial entrenchment is even exacerbated when the CEO also holds the position of chairman of the board. (d) Large boards, boards with a high proportion of non-executive directors and boards with separate persons fulfilling the tasks of CEO and chairman, replace the CEO more frequently, although these boards are not more apt to replace underperforming management. (e) There is also little consistent evidence that the market in large ownership stakes influences CEO turnover.

My sample selection models generate the following results on CEO compensation: (a) The CEOs' industry-adjusted monetary compensation is strongly performance-sensitive: monetary compensation rewards both past good industry-adjusted accounting and stock price performance. (b) Consistently with the predictions of 'managerial power/skimming' models of Bebchuk and Fried (2003) and Bertrand and Mullainathan (2001), CEO remuneration is more sensitive to stock price performance in firms with strong outside shareholders whereas remuneration in insider-dominated firms[4] is more sensitive to measures of accounting returns. (c) When stock prices decrease, CEOs seem to compensate disappointing stock performance by augmenting the cash-based compensation package. (d) The presence of a remuneration committee has no impact on the performance sensitivity of cash remuneration. (e) I find that CEOs' monetary compensation is not only positively related to corporate performance but also increases with size and risk of the firms they manage.

The remainder of the chapter is organized as follows. In the next section, the research hypotheses are motivated. Section 3.3 discusses the sample selection procedure, describes the variables and reveals the data sources. In the same section, the different estimation techniques are explained. Section 3.4 presents the results while Section 3.5 discusses detailed robustness tests. The conclusions are presented in Section 3.6.

3.2. Determinants of CEO compensation and of managerial turnover

3.2.1. Background agency literature

Coughlan and Schmidt (1985) were the first to document that the likelihood of forced turnover is a decreasing function of corporate performance; a finding further corroborated by a.o. Warner et al. (1988), Weisbach (1988), Denis and Denis (1995), and Franks et al. (2001). The disciplinary character of managerial turnover is influenced by board size (Yermack,

[4] Throughout the chapter, I label all directors as insiders because directors usually possess superior information compared to shareholders (even large shareholders). Hence, a company in which directors have the strongest voting power is called an 'insider-dominated firm' whereas a company in which large shareholders exert most voting power is called an 'outsider-dominated firm'.

1996), board composition (Weisbach, 1988), ownership structure (Kang and Shivdasani, 1995; Denis et al., 1997), and is industry-dependent (Parrino, 1997). Forced executive resignations in the US are accompanied by positive and statistically significant abnormal stock performance (Denis and Denis, 1995) provided that an outsider is appointed as CEO (Borokhovich et al., 1996; Rosenstein and Wyatt, 1997). Finally, CEO turnover is the ultimate element of an 'error-correcting process', for it affects firm's investment decisions, giving a stimuli to divest poorly performing acquisitions (Weisbach, 1995).

The theoretical blueprint of pay-for-performance remuneration was laid by the principal-agent models of Jensen and Meckling (1976), Holmström (1979), and Grossman and Hart (1983). A multi-period setting has enabled the analysis of career concerns that also affect executive compensation contracts (Gibbons and Murphy, 1992).[5] Following Holmström (1982a), it is relative rather than absolute performance that is shown to be a valid determinant of CEO remuneration (Gibbons and Murphy, 1990).[6] Performance-sensitivity of managerial compensation is empirically well documented for US firms (e.g. Coughlan and Schmidt, 1985; Jensen and Murphy, 1990). Executive pay depends on both past stock returns and past accounting measures (Sloan, 1993) as well as on relative measures of performance (Gibbons and Murphy, 1990). Still, the level of executive compensation depends not only on past performance: also important are company size (Murphy, 1985), CEO age and tenure (Conyon and Murphy, 2000; Murphy, 1986). Furthermore, the following characteristics also explain part of the changes in remuneration: ownership structure (Core et al., 1999), board composition (Hallock, 1997), threat of takeover (Agrawal and Knoeber, 1998), merger and acquisition policy (Girma et al., 2002), company risk, growth opportunities, dividend policy (Lewellen et al., 1987), and the country where the company is operating (Conyon and Murphy, 2000). The optimal balance of stock- and cash-based compensation solves a trade-

[5] Brickley et al. (1999) document that career concerns provide incentives even for CEOs on the verge retirement as the well performing CEOs are more likely to be awarded non-executive directorships after their retirement.

[6] Similar arguments are made in the so-called tournament models (Lazear and Rosen, 1981).

off between short- and long-term incentives (Narayanan, 1996). While cash compensation creates short-term incentives (and therefore mitigates long-run overinvestment), stock-based compensation may provide appropriate incentives and reduce long-term underinvestment problems (Dechow and Sloan, 1991). Finally, Kole (1997) argues that optimality of a given compensation structure crucially depends on the characteristics of the assets managed by a given CEO.

Recent literature criticizes the agency approach that considers managerial compensation to be the optimal outcome of the contracting problem (Bertrand and Mullainathan, 2000; Bebchuk and Fried, 2003). According to the 'skimming model' of the executive remuneration, directors themselves are able to set their own (excessive) pay in firms with inferior governance standards (Bertrand and Mullainathan, 2001). Apart from the availability of funds, the only constraint deemed to curb such a managerial discretion is the fear of causing the 'outrage' among shareholders potentially angered by excessive pay of the company executives (Bebchuk et al., 2002).

3.2.2. Motivation of hypotheses

The importance of the disciplining role of managerial dismissals is widely accepted. Still, setting a correct performance yardstick is problematic as both accounting and stock price performance have some deficiencies. Accounting information records only past corporate performance and can be manipulated over a period of several years by top management (see e.g. Healy, 1985; Chan et al., 2004). Stock price performance captures the firm's ability to generate value in the future and may hence already include the effects of an expected change in CEO. Therefore, I argue that both stock-based and accounting-based measures of performance provide incremental information about executives' productivity.

Hypothesis 3.1 (Disciplinary role of managerial turnover): *Poor accounting and past stock market-based performance positively affect the likelihood of CEO turnover.*

The essence of the agency literature is that in order to induce agents to exert (costly) effort, the principal has to provide them with appropriate incentives. Jensen and Meckling (1976) suggest (partial) equity ownership by managers as a way of mitigating this problem, but Murphy (1986) finds only little empirical support for this mechanism. Fama (1980) discounts the idea of pay-for-performance contracts for managers with short track records because, if managers believe that subsequent wage offers will depend on current levels of performance, they will work hard today to build up reputational value independent of incentive compensation.[7] Holmström (1982b) challenges this idea and shows that although the effects of labor-market discipline can be substantial, it is not a perfect substitute for contracts.[8] Gibbons and Murphy (1992) extend the Holmström model by introducing Fama's reputation concept and show that the optimal compensation contract optimizes total incentives: the combination of the implicit incentives from career concerns and the explicit incentives from the compensation contract.

Managerial compensation schemes may be an appropriate device complementing performance-related turnover for the following reasons. First, many managers can be subjected to this incentive mechanism, while performance-induced disciplinary turnover only affects a few top managers. Second, Chang (1995) argues that for industries where industry-specific skills are required, performance-based compensation is likely to be a more effective solution to agency problems than the threat of dismissal. Third, as disciplinary turnover penalizes underperformance, the mere fact of being able to avoid poor performance (and, hence dismissal) does not constitute the right incentive for well-performing managers to pursue a value-maximizing strategy. If higher managerial effort induces better corporate performance, there is an important rewarding role for performance-dependent bonus and

[7] There is some evidence that the managerial labor market and hence managerial reputation plays an important role. Top managers leading poorly performing firms will be offered fewer non-executive directorships (Kaplan and Reishus, 1990).

[8] In the absence of contracts, managers are expected to work too hard in their early years (when market is still assessing the manager's ability) and not hard enough in later years.

option schemes.[9] Imperfect observability of top management's actions creates opportunities for moral hazard that adversely affect the contracting with a manager (Holmström, 1979). The efficiency of contracting can be improved by using informative signals about executive's effort. Following this argument, Bushman and Indjejikan (1993), and Kim and Sloan (1993) develop models in which the CEO's compensation depends on both accounting- and stock-based performance measures. Both indicators are considered noisy signals of managerial effort, but as long as they are incrementally informative about managerial actions, they enter a performance-dependent wage formula with non-zero weight.[10] They argue that constructing employment contracts dependent on both stock returns and accounting measures of performance shields the CEO from market-wide changes and thus improves contracting efficiency.

Hypothesis 3.2 (Rewarding effect of compensation): *Past performance (both in terms of accounting-based and stock market-based measures) positively influences the level of the CEO monetary compensation.*

Decisions about hiring and firing top management as well as about the remuneration are ultimately taken by the board of directors. The higher the degree of independence of the board from top management, the higher is likely to be the level of performance-induced turnover. Still, the empirical US literature comes up with conflicting results. Weisbach (1988) shows that board structure affects the likelihood of disciplinary turnover: poorly performing CEOs are more frequently fired provided that the board is outsider-dominated. This conclusion is challenged by Mikkelson and Partch (1997), and Agrawal and Knoeber (1996)

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[9] Pay-for-performance compensation schemes may also have a punishing role provided that the bonus is forgone in case of poor performance and the base salary is scaled down. Although such a contract could achieve both the goals of disciplining and rewarding simultaneously, it is not observed empirically. Gregg et al. (1993) document that managerial compensation tends to increase over time, even in periods of bad performance.

[10] This argument of using both types of performance measures (stock- and accounting-based) as determinants of CEO compensation is also invoked in some of the empirical literature for US firms (Core et al., 1999; John and Senbet, 1998; Mehran, 1995).

who show that managerial turnover is unrelated to board composition. Instead, turnover seems to result mainly from the pressure of the takeover market (Martin and McConnell, 1991). For the UK, Franks et al. (2001) do not find that a high proportion of independent directors leads to stronger managerial disciplining in the poorly performing firms. What does seem to matter is separating the functions of CEO and chairman of the board.

For the US, there is ample evidence that forced turnover follows from monitoring by large (activist) block holders and by the external control market (e.g. Denis and Denis, 1995; Bethel et al., 1998). For UK firms, Franks et al. (2001) confirm that these mechanisms also play a leading role in managerial replacement.

Hypothesis 3.3a (Governance effects on turnover): *Ownership concentration as well as independent boards of directors positively affect the likelihood of managerial turnover in poorly-performing firms.*

There is little empirical research on the relation between governance mechanisms and CEO employment/remuneration contracts. Still, the degree of independence of the board of directors may have a direct impact on managerial compensation as it is the non-executive directors (or their representatives in a remuneration committee) who set the remuneration contracts. In addition, shareholders monitor the firm when their share stakes are sufficiently large such that the benefits from monitoring exceed the costs (Admati et al., 1994; Maug, 1998; Kahn and Winton, 1998) and may set the terms of CEO employment contracts. Core et al. (1999), Bertrand and Mullainathan, (2000), and Crespi et al. (2002) illustrate that the ownership structure may influence the level of managerial compensation.

Hypothesis 3.3b (Governance effects on compensation): *Ownership concentration as well as independent boards of directors positively affect the level of performance sensitivity of the CEO cash compensation.*

The intensity of monitoring may not only depend on mere ownership concentration but also on the type of block holders. In particular, substantial insider ownership may lead to

managerial entrenchment, which decreases the performance-sensitivity of managerial turnover and reduces the likelihood of CEO dismissal (Chung and Pruitt, 1996; Denis et al., 1997). Outside block holders may hold management responsible for poor performance and attempt to remove them. Even across different types of outside shareholders (institutions, families, or industrial firms), the incentives to monitor may differ. Institutions may be passive shareholders in order not to reduce the liquidity of their investment portfolios as a result of insider trading legislation. Other outside shareholders may not be hindered by such constraints. It is also likely that the decision criteria to remove underperforming management may depend on the type of owner. For example, a reduction in share value or negative abnormal returns may trigger intensified monitoring by outside shareholders and increase top management dismissal. In firms with diffuse ownership, in contrast, substitution of top management may only take place (too) late due to lack of large shareholder monitoring and may happen after a substantial decrease in corporate performance, like negative accounting earnings.

Hypothesis 3.4a (Block holder identity effect on turnover): *The type of controlling shareholders affects the likelihood of managerial turnover: monitoring by outside block holders (institutions, families and individuals, industrial firms or the government) leads to increased performance-related CEO removal whereas insider block holders impede top executive changes. Furthermore, the decision criterion of CEO dismissal is related to the type of controlling block holder: in companies with monitoring outside block holders, the CEO is replaced after poor stock price performance, whereas in widely-held firms or firms with strong insider ownership the decision criterion is based on negative accounting results.*

A similar argument applies to the pay-for-performance schemes of top management. Managers with a high level of decision discretion (resulting from diffuse ownership and weak boards) may set their own pay and performance criteria (Bebchuk and Fried, 2003; Bertrand and Mullainathan, 2001). In these cases, I expect pay-for-earnings performance contracts to

be more prominent as top management can to some extent influence accounting policies (Healy, 1985). Apart from the availability of funds, the only constraint deemed to curb such a managerial discretion is the fear of causing the 'outrage' among shareholders potentially angered by excessive pay of the company executives (Bebchuk et al., 2002). In firms with high outsider control concentration, the value maximization criterion may be translated into pay-for-share price performance remuneration schemes. Core et al. (1999) find that both size of the CEO equity stake and presence of outside block holdings are significant determinants of executive pay in the US. Clay (2000) argues that monitoring activities are delegated to some classes of owners (namely financial institutions) and that the presence of activist shareholders leads to higher levels of CEO compensation, simultaneously increasing performance-sensitivity.

Hypothesis 3.4b (Block holder identity effect on compensation): *In firms with a diffuse ownership structure or strong concentration of insider control, pay-for-accounting performance remuneration contracts prevail whereas in outside block holder-controlled firms pay-for-share price performance compensation contracts are imposed.*

Denis and Sarin (1999), and Denis and Kruse (2000) show that changes in ownership structure imply adjustments in board composition, and consequently result in changes in the management team. This tends to indicate that monitoring activities are a function of ownership dynamics rather than of a *status quo* of ownership concentration. Not only full takeovers, but also the acquisition of substantial blocks result in substantial policy changes in target firms (Spencer et al., 1998; Jenkinson and Ljungqvist, 2001).

Hypothesis 3.5a (Ownership dynamics effect on turnover): *Changes in ownership structure influence the likelihood of managerial turnover: new block holders with strong monitoring abilities are more likely to remove the CEO in the wake of poor performance.*

Hypothesis 3.5b (Ownership dynamics effect on compensation): *Changes in ownership structure influence the level of the CEO cash compensation. The presence of new block holders with strong monitoring abilities leads to a stronger pay-for-performance relation.*

3.3. Sample description and methodological approach

3.3.1. Sample description

The sample consisting of 250 UK firms is randomly drawn from the population of all companies quoted on the London Stock Exchange, excluding financial institutions, real estate companies and insurance companies. For a company to be included in the sample I require that data for at least three consecutive years within the six years time window (1988-1993) are available.[11] A data panel was constructed for this six-year period. My sample period terminates in 1993 when the London Stock Exchange imposed the recommendations for good corporate governance of the Cadbury report on all listed firms.[12] Thus, the sample period is characterized by lower corporate governance standards than more recent years, and is therefore particularly interesting from an agency-theory point of view.

3.3.2. Variable definitions and data description

All data on managerial compensation, turnover and board composition were retrieved from the Directors' Report and the Notes in the annual reports. In my sample, approximately 11% of CEOs lost their position in a given year (Table 3.1). The mean and median logarithm of cash compensation (salary and bonus) was 11.88 and 11.91, respectively (which corresponds to approximately £ 144,000 and £ 149,000). The median age of a CEO is 52 years (with a mean of 52.6). The median tenure equals 4 years (with a mean of 5.2). Every third CEO also holds the position of chairman of the board of directors. The median board

[11] Hence, the sample also includes those firms that were taken over or went bankrupt. Seven of the 250 companies were dropped because accounting data were not available from Datastream.

[12] For the effect of the Cadbury recommendations on performance and turnover, see Dahya et al. (2002).

consists of 9 directors, 61.5% of whom are non-executive directors. Finally, in approximately 26% of the sample firm-years, CEO compensation is determined by a remuneration committee.[13] The fraction of companies having such a committee increases substantially towards the end of the sample period (as documented also by Conyon et al., 1995). Turnover data are corrected for natural turnover. I distinguish between natural and forced turnover, classifying a resignation as 'natural' if the director was described as having left the board for reasons of retirement, death or illness. Otherwise the resignation was classified as being forced. The normal retirement age is between 62 and 65 but some voluntary retirement does occur before that; I took 62 as the minimum retirement age and viewed any earlier retirement as forced.

Ownership data both for existing and new shareholders for each year of the period 1988-1993 were also collected from the Directors' Report and the Notes in the annual reports. All the directors' holdings greater than 0.1% are recorded as well as other shareholders' stakes of 5% and more (3% and above from 1990 when the statutory disclosure threshold was reduced). The status of the directors (executive/non-executive) and the dates of joining and leaving the board were also obtained from the annual reports and from contacting the firms directly by phone or fax. Non-beneficial share stakes held by the directors on behalf of their families or charitable trusts were added to the directors' beneficial holdings. Although directors do not obtain cash flow benefits from these non-beneficial stakes, they usually exercise the voting rights. For equity stakes in Nominees accounts, the identity of the shareholders was found by contacting the listed firms directly. In 97% of these cases, the shareholders of Nominees accounts were institutional investors.

As is typical for Anglo-American firms, the ownership concentration shown in Table 3.1 is relatively low. The median Herfidahl-5 index equals only 0.028 (with a mean of 0.057). Most of CEOs do not hold substantial share stakes: the average CEO owns less than 3% of the

[13] The presence of such committees (postulated by Cadbury report) can alter compensation policies and eliminate the situation when the remuneration decision is largely influenced by CEOs themselves (Conyon, 1994).

Table 3.1. Sample characteristics.

	Median	Mean	Std. deviation
CEO turnover			
CEO dismissal	0.000	0.110	0.313
CEO compensation			
Industry-adjusted logarithm of salary	0.000	0.002	0.623
Logarithm of salary	11.878	11.909	0.687
CEO characteristics			
CEO age	52.000	52.581	6.343
CEO tenure	4.000	5.151	5.482
CEO is the board chairman	0.000	0.335	0.472
Board composition			
Fraction of outside directors	61.540	61.411	15.035
Board size	2.197	2.173	0.372
Remuneration committee presence	0.000	0.259	0.438
Ownership variables			
Herfindahl-5 concentration index	0.028	0.057	0.084
CEO stake	0.000	2.983	8.095
Executives' stake	0.120	4.572	10.746
Non-executives' stake	0.000	3.914	9.625
Institutions' stake	13.000	16.596	16.116
Families/indiv.'s and corporations' stake	0.000	8.218	14.083
Increase in executives' stake	0.000	0.729	3.376
Increase in non-executives' stake	0.000	0.513	2.935
Increase in institutions' stake	3.100	6.402	8.802
Increase in fam./indiv./corporations' stake	0.000	1.842	5.911
Performance indicators			
Abnormal stock return in year *t*	-5.195	-2.506	47.150
Abnormal stock return in year *t*-1	-3.710	-2.418	38.173
Abnormal stock return in year *t*-2	-1.370	2.063	41.054
Return on assets in year *t*	16.315	15.234	26.572
Return on assets in year *t*-1	18.100	17.704	20.420
Return on assets in year *t*-2	19.590	19.000	20.194
Firm-specific control variables			
Firm size	11.259	11.349	1.794
Capital gearing	29.715	32.651	24.784
Risk	34.390	37.429	13.070

Note to Table 3.1: CEO dismissal is a dummy variable that equals one for firm-years in which CEO change took place. Logarithm of salary is a natural logarithm of CEO total cash compensation (including bonuses) expressed in pounds. Industry-adjusted logarithm of salary is an industry-year median-adjusted logarithm of CEO salary (as defined above). CEO age and tenure are measured in years. The last of the CEO characteristics is a dummy variable that equals one for those CEOs who also hold the function of chairman of the board. The fraction of outside directors is expressed as a percentage of the total number of directors. The board size is defined as a natural logarithm of the total number of directors. The presence of a remuneration committee is a dummy variable equaling one for those firm-years for which a remuneration committee is in place. The Herfindahl-5 concentration-index is calculated using the equity stakes of the five largest shareholders. The following ownership variables represent cumulative total percentage stakes for the CEO, executive directors, non-executive directors, financial institutions, families and individuals, and corporations, respectively (as revealed in company reports). The remaining four ownership variables correspond to increases (in percentage points) of cumulative stakes held by executives, non-executives, financial institutions, families and individual shareholders, and corporations. The first three performance indicators are abnormal stock returns (in percentage terms) and their values lagged one and two years, respectively. Return on assets (contemporaneous, lagged one and two years) is defined as the ratio of EBIT over total assets in a given year. Firm size is proxied by a natural logarithm of the total book value of assets. Capital gearing is defined as the ratio of debt to total assets and expressed in percentage terms. Risk is measured as an annual volatility of stock returns.

equity (with a median of zero). The median of the combined shareholdings of all executive directors (excluding CEO) amounts to less than 1%, with an average of slightly below 8%. Stakes of non-executives are lower and do not exceed 4%, on average. The most important class of block holders consists of financial institutions: they hold a (cumulative) median stake of 13% (a mean of 16.6%). Finally, other outsiders – individuals, families and industrial firms – control on average 8.2% of equity. There is also evidence of a market in (small) block holdings. Gross increases in holdings by institutions and by other outsiders amount to 6.4% and 1.8%, respectively, which accounts for half and one fourth of the average equity stakes held by those shareholder classes.

As proxies for stock performance, I employ annual abnormal stock returns (in percentage terms), which are collected from the London Share Price Database (LSPD). Abnormal returns are calculated using the market model and corrected for thin trading.[14] The sample companies underperformed the benchmark by approximately 2.5% in year *t* (see

[14] Both a Dimson (1979)-correction for non-synchronous trading and a Vasicek (1973)-Bayesian updating are applied.

Table 3.1). I also use alternative performance measures like the percentage dividend changes (between years t - 2 and t - 1, and between t - 1 and t, respectively), which are collected from Datastream, and employ return on assets (earnings before interest and taxes over book value of total assets) as accounting-based performance indicators. All accounting data are collected from Datastream and are cross-checked with the information from annual reports.

In order to control for (potential) size effects, I introduce the logarithm of total assets (in £ thousands) at the end of a given year. For the median (mean) company in the sample, this value equals to 11.35 (11.26), which corresponds to approximately £ 85 million (£ 78 million). The median and mean ratios of capital gearing (defined as long term-debt on total assets) equal 29.72% and 32.65%, respectively. Finally, I measure risk by the annual volatility of stock returns, which is gathered from the LSPD. The median and mean values amount to 34.39% and 37.43%, respectively.

Some important data are not available for this study. First, non-cash elements of CEO remuneration (in particular stock- and option-grants) are not disclosed for my sample period. At best, the annual reports only mention that some managerial options were outstanding without consistently revealing the number of options outstanding, the exercise price, and the number of options exercised in the preceding year. Only in the years subsequent to 1995 when the Greenbury report was issued), only some of this information became available. Second, the presence of director interlocks might affect the level of managerial compensation as well (Hallock, 1997). Finally, my sample period is relatively short but extending the data set beyond 1993 would be problematic due to structural differences between pre- and post-Cadbury period.

3.3.3. Methodology

I employ the following econometric techniques. First, sample selection models are applied to analyze jointly executive compensation and turnover. Second, in order to assure robustness of conclusions, survival analysis is applied to investigate factors leading to

managerial turnover. I also analyze corporate remuneration using a fixed-effect panel regression framework in order to compare these estimates with the results from the sample selection models. This allows me to draw some conclusions about whether or not the fixed-effect methodology or simple OLS regressions, frequently used in previous research, biases the results of earlier studies.

I simultaneously explain managerial turnover and compensation within a sample selection model framework. The model, often referred to as a type-2 Tobit model, is specified as follows:

$$\begin{cases} y^*_{1\,it} = X'_{1\,it}\,\beta_1 + \varepsilon_{1\,it} & \text{(3.1a)} \\ y^*_{2\,it} = X'_{2\,it}\,\beta_2 + \varepsilon_{2\,it} & \text{(3.1b)} \end{cases}$$

$$y_{1it} = \begin{cases} 1 & \text{if } y^*_{1it} > 0 \\ 0 & \text{if } y^*_{1it} \le 0 \end{cases} \qquad \text{(3.2)}$$

$$y_{2it} = \begin{cases} y^*_{2it} & \text{if } y^*_{1it} > 0 \\ 0 & \text{if } y^*_{1it} \le 0 \end{cases} \qquad \text{(3.3)}$$

where $\{\varepsilon_{1it}, \varepsilon_{2it}\}$ are drawn from a bivariate normal distribution with mean 0, variances σ_1^2 and σ_2^2, and covariance σ_{12} (Amemiya, 1984). *y*-variables are quantities of interest while *X*-variables correspond to the explanatory variables. Finally, β_1 and β_2 are vectors of the model coefficients. It is assumed that only the sign of y^*_{1it} is observed and that y^*_{2it} is observed only when $y^*_{1i} > 0$. Moreover, it is assumed that X_{1i} are observed for all *i*, but X_{2i} need not be observed for *i* such that $y^*_{1it} \le 0$. Finally the two sets of explanatory variables, i.e. X_{1it} and X_{2it}, are not disjoint (they can differ, however).

In a standard setting, error terms are assumed to be i.i.d. drawings from a bivariate normal distribution. In my models, *i* corresponds to a firm and *t* to a year. I relax the assumption of independence of ε's across *i* and allow clustering of observations corresponding to a given firm, i.e. I assume error terms to be i.i.d. across firms, but not necessarily for different observations within the same firm. All the reported standard errors of estimates are

adjusted for clustering (StataCorp, 2001). This procedure enhances robustness of the findings and allows me to take the panel data structure of the sample explicitly into account. To estimate the type-2 Tobit models, I employ a two-step procedure suggested by Heckman (1979), which yields consistent parameter estimates.

Throughout the chapter I call equation (3.1a) a selection equation, while equation (3.1b) is referred to as a regression equation. The selection equation explains CEO turnover, i.e. $y_{1it} = 1$ corresponds to those firm-years when the CEO kept his position. The regression equation explains the compensation of such CEOs in the subsequent year. As the notion of compensation sensitivity to previous year performance is not meaningful for new CEOs, I restrict the remuneration analysis to CEOs with a tenure of more than one year. Estimating the parameters of the regression equation (3.1b) on the basis of the non-turnover sample only, would not be a valid alternative to the proposed method because the OLS estimator of β_2 is biased when the selection of the regression sample is endogenous (i.e. $\sigma_{12} \neq 0$). Instead, my sample selection model deals with the endogeneity of selection, and therefore renders reliable parameter estimates for the regression equation (Greene, 2000).

The hypotheses pertaining to ownership variables are tested within Tobit-2 models with interaction terms. This can be illustrated by the following general example. Consider a given model of the form:

$$\begin{aligned} y_i = {} & \beta_0 + \beta_1 \cdot Perf_i + \beta_2 \cdot InsOwn_i + \beta_3 \cdot OutOwn_i + \\ & + \beta_4 \cdot Perf_i \cdot InsOwn_i + \beta_5 \cdot Perf_i \cdot OutOwn_i + \mathrm{B} \cdot \mathrm{X}_i + \varepsilon_i, \end{aligned} \tag{3.4}$$

where y is a dependent variable; $\beta_0, \beta_1, \ldots, \beta_5$ and a vector B are model parameters; $Perf_i$ is the analyzed performance indicator; $InsOwn_i$ and $OutOwn_i$ are (median-centered)[15] stakes controlled by insiders and outsiders, respectively; X_i is a vector containing other regressors;

[15] In models with interaction terms, variable-centering is applied for two reasons: (i) it mitigates collinearity problems; (ii) it results in straightforward interpretation of the main-effect coefficient - such a coefficient shows the strength of the relationship for a median (or mean) level of the moderating variable (Aiken and West, 1991).

and ε_i is an error term. The conditional estimate (*CE*) of the effect of the performance variable on *y* (given $InsOwn_i$ and $OutOwn_i$) in such a model can be expressed as:

$$\hat{CE}_{Perf}(InsOwn_i, OutOwn_i) = \hat{\beta}_1 + \hat{\beta}_4 \cdot InsOwn_i + \hat{\beta}_5 \cdot OutOwn_i, \tag{3.5}$$

where ^ denote estimates of the parameters. Such conditional estimates for one of my models are illustrated by Figures 3.1, 3.3, 3.5, and 3.7 (of which the discussion will follow in Section 3.4).

The variance of this conditional estimate is given by:

$$\begin{aligned}
&\operatorname{var}\left\{\hat{CE}_{Perf}(InsOwn_i, OutOwn_i)\right\} = \\
&\operatorname{var}\left\{\hat{\beta}_1\right\} + InsOwn_i \cdot \operatorname{var}\left\{\hat{\beta}_4\right\} + \\
&+ OutOwn_i \cdot \operatorname{var}\left\{\hat{\beta}_5\right\} + 2 \cdot InsOwn_i \cdot \operatorname{cov}\left\{\hat{\beta}_1, \hat{\beta}_4\right\} + \\
&+ 2 \cdot OutOwn_i \cdot \operatorname{cov}\left\{\hat{\beta}_1, \hat{\beta}_5\right\} + 2 \cdot InsOwn_i \cdot OutOwn_i \cdot \operatorname{cov}\left\{\hat{\beta}_4, \hat{\beta}_5\right\}.
\end{aligned} \tag{3.6}$$

Finally, the conditional z-statistic (illustrated for one of the models by Figures 3.2, 3.4, 3.6, and 3.8) is defined as:

$$z = \frac{\hat{CE}_{Perf}(InsOwn_i, OutOwn_i)}{\sqrt{\operatorname{var}\left\{\hat{CE}_{Perf}(InsOwn_i, OutOwn_i)\right\}}}. \tag{3.7}$$

Under the null hypothesis (H_0: Conditional performance sensitivity = 0), it has an asymptotic standard normal distribution (Aiken and West, 1991).

In order to investigate robustness of the type-2 Tobit models, the determinants of CEO turnover are also analyzed with Cox proportional hazard regressions (Cox, 1972; Cox and Oakes, 1984). The hazard function is defined as:

$$h_i(t) = \lim_{\Delta \to 0^+} \frac{\Pr(t \le T_i < t + \Delta \mid t \le T_i)}{\Delta}, \tag{3.8}$$

where T_i is the date of dismissal of CEO *i*. Hence, the hazard function for a given manager can be interpreted as the marginal conditional probability of being replaced in the time instant Δ given that he or she was not replaced up to time *t*. Consequently, a positive parameter

estimate for a given variable reflects that larger values of this variable increase the probability of CEO dismissal.

The basic proportional hazard model looks as follows:

$$h_i(t) = \psi(X_i, \beta) \cdot h_0(t), \tag{3.9}$$

where $h_i(\cdot)$ is the hazard function for individual *i*, $\psi(\cdot)$ is some function of model covariates X_i and of parameters β, and $h_0(\cdot)$ is the underlying (unspecified) baseline hazard function. Following the literature, I use a log-linear specification, i.e. I impose the following form of the function ψ:

$$\psi(X_i, \beta) = \exp(X_i'\beta). \tag{3.10}$$

The advantage of this approach is that I do not have to parameterize the baseline hazard function. Instead, since I am mainly interested in the values of model parameters β, I need to maximize only the partial likelihood, which for a given observation can be expressed as:

$$L_i = \frac{\exp(X_i'\beta)}{\sum_{j \neq i} \exp(X_j'\beta)} \tag{3.11}$$

and does not depend on h_0 (Geddes and Vinod, 1997).

I allow the explanatory variables to be time-varying, which results in multiple observations for each of the analyzed firms. In order to assure robustness of the results, I account for possible dependence between different observations corresponding to the same firm. I allow for clustering and implement the procedure, which assumes the observations to be independent across firms, but does not require different observations on the same firm to be independent (StataCorp, 2001). Finally, a robust estimate of the coefficient covariance matrix is computed as in Lin and Wei (1989).

3.4. Results

In Section 3.4.1, I discuss the results from the sample selection models which simultaneously explain CEO turnover and compensation. Subsequently, the hazard rate analyses of managerial survival are outlined in Section 3.4.2.

3.4.1. Sample selection models explaining managerial compensation

The results of Panel A of Table 3.2 support the disciplinary role of managerial turnover (Hypothesis 3.1) as performance is positively correlated to future turnover in the selection equations. This effect is highly significant for the industry-adjusted accounting-based performance measure, but less so for stock performance. Managers generating high corporate performance (above the industry return on assets) are more likely to keep their position during the subsequent year. Strong support for Hypothesis 3.2 (the rewarding effect of compensation) can be found in Panel B of Table 3.2. In all models, cash compensation, consisting of salary and bonus, is sensitive to both past accounting and stock price performance within the 5% (and frequently 1%) level of statistical significance.

I also obtain strong results for the relationship between turnover and board characteristics (Panel A). Contrary to the US evidence of e.g. Yermack (1996), the presence of larger boards facilitates the replacement of the CEO in the UK. It may be that larger boards are a proxy for a larger internal pool of managerial talent. My findings also confirm the intuition of the 1993 Cadbury report, the 'Recommendations for Good Corporate Governance': boards with a larger percentage of outside, independent directors replace CEOs more frequently. Still, the interaction terms of the proportion of non-executive directors and both performance measures (not shown)[16] are not statistically significant. This suggests that boards with a high proportion of non-executive directors do not appear significantly more apt to replace underperforming management. Therefore, I cannot support the part of

[16] Models with interactive terms of board characteristics and performance are available upon request.

Table 3.2. Sample selection models explaining CEO turnover and industry-adjusted cash compensation.

	Model 3.1		**Model 3.2**		**Model 3.3**		**Model 3.4**	
Panel A: Selection equations	**Dependent variable equals 0 if the CEO is replaced and 1 otherwise**.							
	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	4.23534	0.000	4.38876	0.000	3.83454	0.000	4.89602	0.000
Performance indicators								
Industry-adjusted ROA in year *t*-1	0.01030	0.001	0.00973	0.011	0.01094	0.058	0.01275	0.001
Abnormal stock returns in year *t*-1	0.00321	0.158	0.00333	0.163	0.00526	0.032	0.00292	0.291
Board composition								
Board size	-0.98560	0.000	-0.90042	0.000	-0.94299	0.000	-0.89115	0.003
Fraction of outside directors	-0.00757	0.058	-0.00823	0.050	-0.00812	0.046	-0.00785	0.545
CEO is also the chairman	0.40096	0.006	0.41711	0.006	0.40528	0.006	0.48601	0.299
Firm size, leverage, and risk								
Firm size	0.05780	0.179	0.03164	0.497	0.08513	0.128	0.04349	0.702
Capital gearing	0.00029	0.909	-0.00020	0.941	-0.00028	0.919	0.00038	0.949
Risk	-0.00776	0.209	-0.00745	0.253	-0.00518	0.374	-0.00564	0.444
Ownership concentration								
Herfindahl-5 concentration index			-0.44790	0.541				
Accounting perf. * Herfindahl-5 index			-0.01529	0.784				
Stock price perf. * Herfindahl-5 index			-0.02514	0.309				
Insiders' block holdings					0.01206	0.042		
Accounting perf. * insider stake					-0.00012	0.638		
Stock price perf. * insider stake					-0.00024	0.023		
Outside block holdings					-0.00428	0.250		
Accounting perf. * outsider stake					-0.00002	0.922		
Stock price perf. * outsider stake					0.00001	0.944		
Ownership dynamics								
Increase in insiders' block holdings							0.00913	0.789
Accounting perf. * increase insider stake							-0.00060	0.389
Stock price perf. * increase insider stake							-0.00029	0.844
Increase in outsiders' block holdings							0.01292	0.229
Accounting perf. * increase outsider stake							-0.00030	0.432
Stock price perf. * increase outsider stake							0.00021	0.429
Year and industry control variables								
Year dummies	Yes		Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes		Yes	
Wald χ^2	$\chi^2(23) = 86.05$		$\chi^2(26) = 63.69$		$\chi^2(29) = 104.78$		$\chi^2(29) = 161.24$	
P-value for χ^2	< 0.001		< 0.001		< 0.001		< 0.001	

Table 3.2 - continued.

	Model 3.1		Model 3.2		Model 3.3		Model 3.4	
Panel B: Regression equations	**Dependent variable is the industry-adjusted CEO cash remuneration**							
	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-3.51081	0.000	-3.48873	0.000	-3.13868	0.000	-3.74666	0.000
Performance indicators								
Industry-adjusted ROA in year *t*-1	0.00356	0.013	0.00389	0.008	0.00318	0.059	0.00636	0.001
Abnormal stock returns in year *t*-1	0.00140	0.002	0.00166	0.001	0.00184	0.001	0.00146	0.025
Board composition								
Board size	0.19077	0.023	0.19291	0.022	0.18921	0.015	0.19297	0.154
Fraction of outside directors	0.00176	0.306	0.00167	0.327	0.00188	0.271	0.00122	0.620
CEO is the board chairman	0.01938	0.675	0.02478	0.595	0.03023	0.525	0.02887	0.655
Remuneration committee presence	-0.00915	0.840	-0.01341	0.768	-0.01916	0.659	-0.04293	0.440
Firm size, leverage, and risk								
Firm size	0.23641	0.000	0.23476	0.000	0.20847	0.000	0.25329	0.000
Capital gearing	0.00097	0.314	0.00086	0.383	0.00073	0.434	0.00041	0.771
Risk	0.00839	0.003	0.00849	0.003	0.00769	0.009	0.01071	0.003
Ownership concentration								
Herfindahl-5 concentration index			-0.32539	0.522				
Accounting perf. * Herfindahl-5 index			-0.00961	0.580				
Stock price perf. * Herfindahl-5 index			-0.00723	0.089				
Insiders' block holdings					-0.00454	0.007		
Accounting perf. * insider stake					0.00007	0.329		
Stock price perf. * insider stake					-0.00005	0.024		
Outside block holdings					-0.00310	0.046		
Accounting perf. * outsider stake					-0.00004	0.506		
Stock price perf. * outsider stake					0.00000	0.942		
Ownership dynamics								
Increase in insiders' block holdings							-0.00041	0.979
Accounting perf. * increase insider stake							-0.00078	0.050
Stock price perf. * increase insider stake							-0.00029	0.251
Increase in outsiders' block holdings							-0.00047	0.863
Accounting perf. * increase outsider stake							-0.00010	0.253
Stock price perf. * increase outsider stake							-0.00001	0.877
Year control variables								
Year dummies	Yes		Yes		Yes		Yes	
Wald χ^2	$\chi^2(13) = 352.92$		$\chi^2(16) = 363.20$		$\chi^2(19) = 500.90$		$\chi^2(19) = 382.29$	
P-value for χ^2	< 0.001		< 0.001		< 0.001		< 0.001	

Table 3.2 - continued.

	Model 3.1	**Model 3.2**	**Model 3.3**	**Model 3.4**
Panel C: Model statistics and tests				
Total no. of observations	851	840	847	695
No. of censored observations	102	94	101	87
No. of uncensored observations	749	746	746	608
Log-likelihood	-644.21	-630.95	-623.95	-495.23
Wald χ^2 statistics for testing joint significance of two equations	$\chi^2(36) = 599.95$	$\chi^2(42) = 586.41$	$\chi^2(48) = 819.24$	$\chi^2(48) = 988.96$
P-value for χ^2	< 0.001	< 0.001	< 0.001	< 0.001
Estimate of ρ	-0.508	-0.465	-0.595	-0.882
Wald χ^2 statistics for testing $\rho = 0$ (tests of equations independence)	$\chi^2(1) = 5.95$	$\chi^2(1) = 3.50$	$\chi^2(1) = 8.21$	$\chi^2(1) = 0.21$
P-value for χ^2	0.015	0.062	0.004	0.648

Note to Table 3.2: The table presents the estimates of the sample selection models for top executive turnover (selection equation of Panel A) and CEO industry-adjusted compensation (regression equation of Panel B). Standard errors are adjusted for clustering of observations on each firm. The dependent binary variable of Panel A equals one for CEOs that were not replaced in a given year and zero otherwise. As far as regressors are concerned, industry-adjusted ROA is defined as industry-year median adjusted return on equity (in percentage terms) lagged one year. Likewise, abnormal stock return is lagged one year. Board size is defined as a natural logarithm of the total number of directors. Fraction of outside directors is expressed as a percentage of outsiders on the board. The last of the board characteristics is a dummy variable that equals one for CEOs serving at the same time the function of board chairmen. Firm size is proxied by a natural logarithm of the total book value of assets. Capital gearing is expressed in percentage terms. Company risk is measured as an annual volatility of stock returns. The Herfindahl-5 concentration index is calculated using the stakes of the five largest shareholders. The block holding variables consist of insider stakes (the amalgamation of the shareholdings of the CEO, executive and non-executive directors). The outsider block holdings are the amalgamation of the stakes held by financial institutions, families and individuals, the government and corporations, respectively, provided the individual stakes are 5% or above. The variables describing ownership dynamics correspond to increases (in percentage points) of cumulative stakes held by insider and outsider shareholders. In the regression equations (Panel B) the dependent variable is an industry-adjusted CEO cash compensation in the subsequent year. The explanatory variables are defined in the same way as in the selection equations. The only difference is that here time-varying regressors are lagged one year less compared to those from Panel A. The remuneration committee presence is a dummy variable that equals one for firm-years, when remuneration committee was in place.

Hypothesis 3.3a referring to the board of directors. My results do not confirm Weisbach's (1988) findings that outsider-dominatedboards, supposedly more independent from management, are more able to enforce disciplinary turnover. Finally, when a person fulfills the tasks of CEO and chairman of the board simultaneously, the likelihood of his or her

replacement is significantly decreased. This danger of conflicts of interest provides further support for the need to separate the positions of CEO and chairman.

There is no significant relation between board characteristics (including those interacted with performance) and the CEO's cash remuneration with the exception of board size (Panel B of Table 3.2). CEOs of firms with large boards receive a larger compensation. Finally, the presence of a remuneration committee (consisting of non-executive directors) has a negative impact on CEO compensation, which hints that these committees mitigate managerial remuneration although this effect is statistically insignificant. I therefore reject that part of Hypothesis 3.3b referring to the characteristics of the board of directors.

There is no relation between total ownership concentration, measured by the Herfindahl-5 index, and CEO turnover (Panel A, Model 3.2). Also, the interactive terms of total ownership concentration with performance are not statistically significant. Hence, these results fail to support Hypothesis 3.3a. Still, when I dissect ownership concentration into outsider and insider ownership concentration (where the latter comprises shareholdings controlled by the CEO, other executive directors and non-executive directors), I find that strong insider control induces a higher probability that the CEO will not be removed (Model 3.3).[17] The results indicate that insiders with large ownership stakes are able to successfully ward off any attempts to replace the CEO regardless of accounting performance.[18] Neither an analysis with outsider ownership concentration (Model 3.3), nor a more detailed analysis with ownership concentration held by institutions, families and

[17] It should be noted that the stakes (both in simple terms and in interactions) are median-centred: zero corresponds to the sample median (i.e. 2.14% of equity is controlled by insiders and 22.80% by outsiders).

[18] When I estimate the models with ownership concentration held by the CEO, executive and non-executive directors separately, I find that it is only the CEO's ownership stake which matters in terms of impeding the CEO's removal. The variables capturing the voting power of the other director classes (and their interaction terms) are not significant but have the same sign as the CEO's ownership concentration. This confirms that little monitoring is performed by non-executive directors. This is in line with the findings of Franks et al. (2001) who state that non-executive directors frequently support incumbent management even in the wake of poor performance. Poor performance is not only the result of poor management but maybe also of poor corporate governance.

individuals, other corporations and the government (not shown) yield any evidence of outside shareholder monitoring. Thus, I conclude that there is only partial support for Hypothesis 3.4a: CEOs with strong voting power seem immune for substitution (be it performance-related or not) and outside shareholders do not seem to play a role in replacing underperforming management. Lai and Sudarsanam (1998), and Franks et al. (2001) also present evidence of managerial entrenchment.

A more detailed analysis of the parameter estimates of Model 3.3 highlights the economic significance of my findings. My results imply that the CEO of the median company has 14.3% probability of losing his or her job. The median firm is characterized by median values of firm specific characteristics (performance, board composition, ownership structure, control variables). In well-performing companies (both performance indicators are at the top quartile values) with median ownership structure and control variables, the probability of CEO turnover drops significantly (to 10.7%), while in poorly performing firms (both performance indicators are at the bottom quartile values), a substantially higher percentage of CEOs (18.6%) departs. Still, the strength of this disciplining effect depends strongly on the control structure of the firm. In an insider-dominated underperforming firm, the corresponding probability is merely 11.4% whereas it is as high as 21.3% for an outsider-dominated company.[19]

The economic effects of insider versus outsider control on CEO turnover (as discussed above) are visualized in Figures 3.1-3.4. Figure 3.1 depicts that the accounting-based performance sensitivity of CEO turnover weakens significantly for larger insider stakes (regardless of outsider control concentration). The test-statistic of the conditional estimates of

[19] Hereafter, an insider-dominated firm denotes a firm with 18.57% of voting equity controlled by the directors (3rd quartile of the insiders' holdings variable) and only 9.40% of shares held by outside block holders (1st quartile of the outsiders' block holdings variable). Analogously, an outsider-dominated company is defined as a firm of which 37.05% of equity is controlled by outside block holders (3rd quartile of the outsiders' block holdings variable) and for which there are no insider block holdings (1st quartile of the insiders' holdings variable equals zero).

Figure 3.1. Conditional estimates of CEO turnover sensitivity with respect to the accounting-based corporate performance for various levels of ownership concentration.

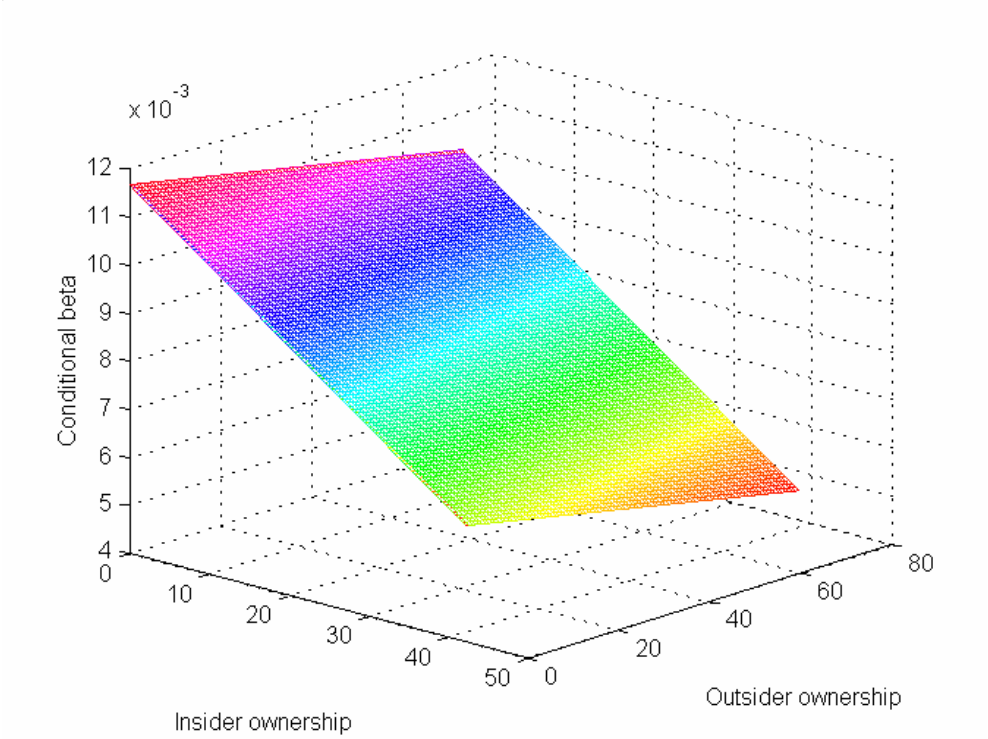
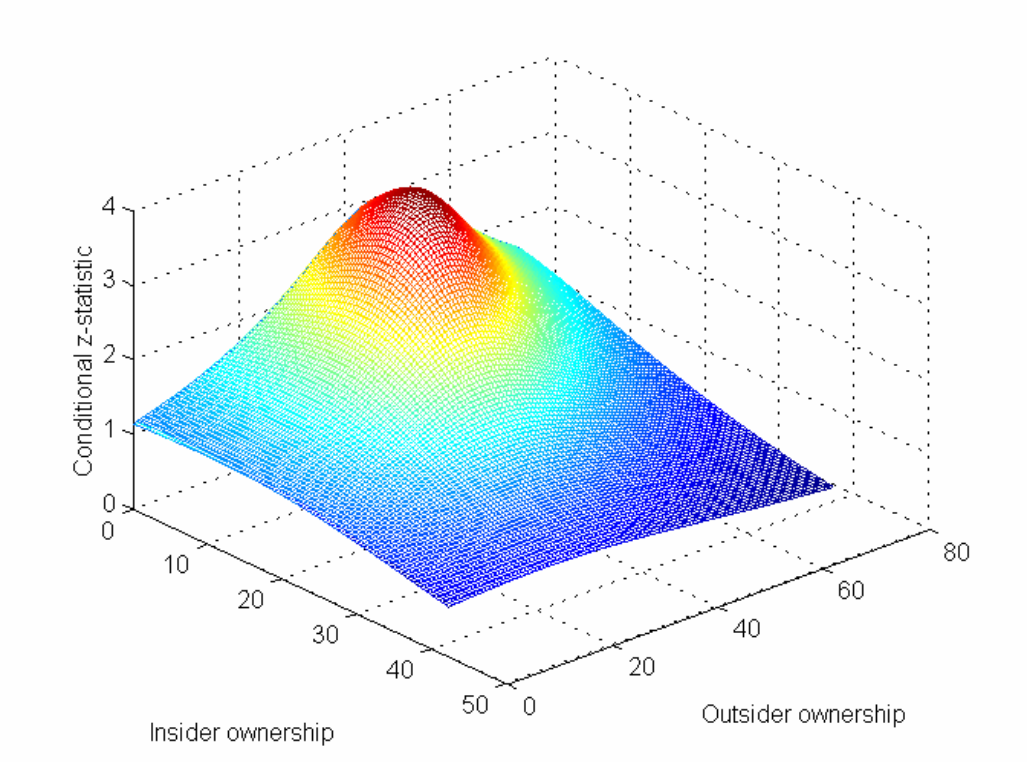


Figure 3.2. Significance of CEO turnover sensitivity with respect to the accounting-based corporate performance for various levels of ownership concentration.



Note to Figure 3.2: Values of the magnitude exceeding 1.96 are significant at 5% level (2-tail test).

Figure 3.3. Conditional estimates of CEO turnover sensitivity with respect to the stock price-based corporate performance for various levels of ownership concentration.

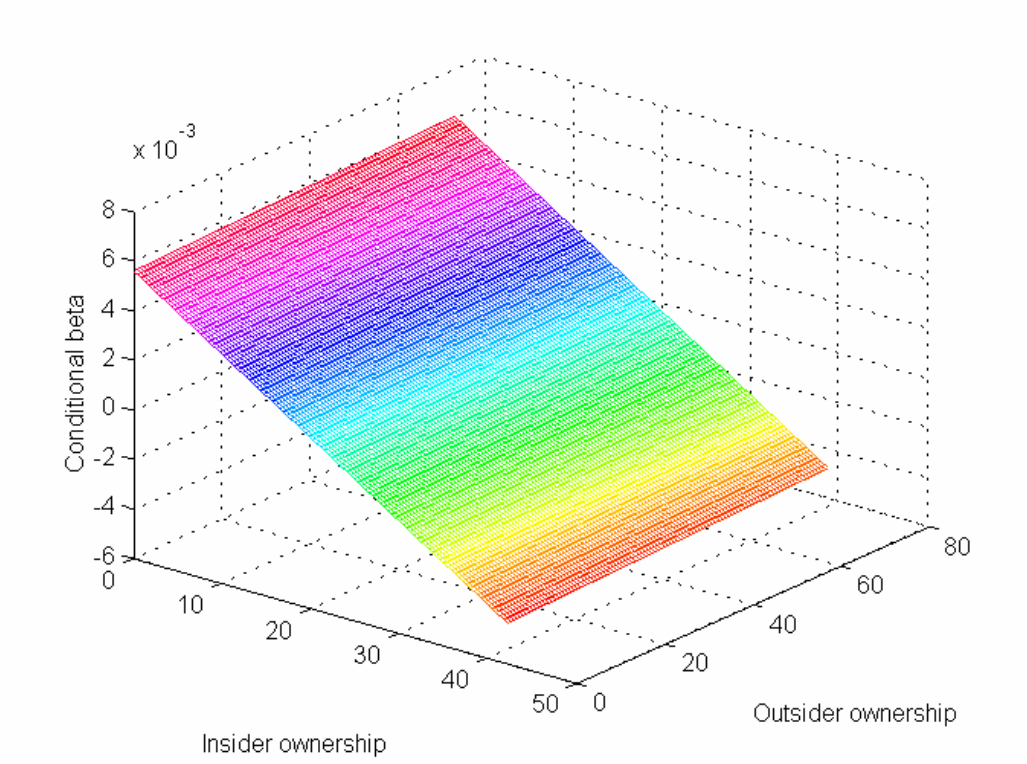
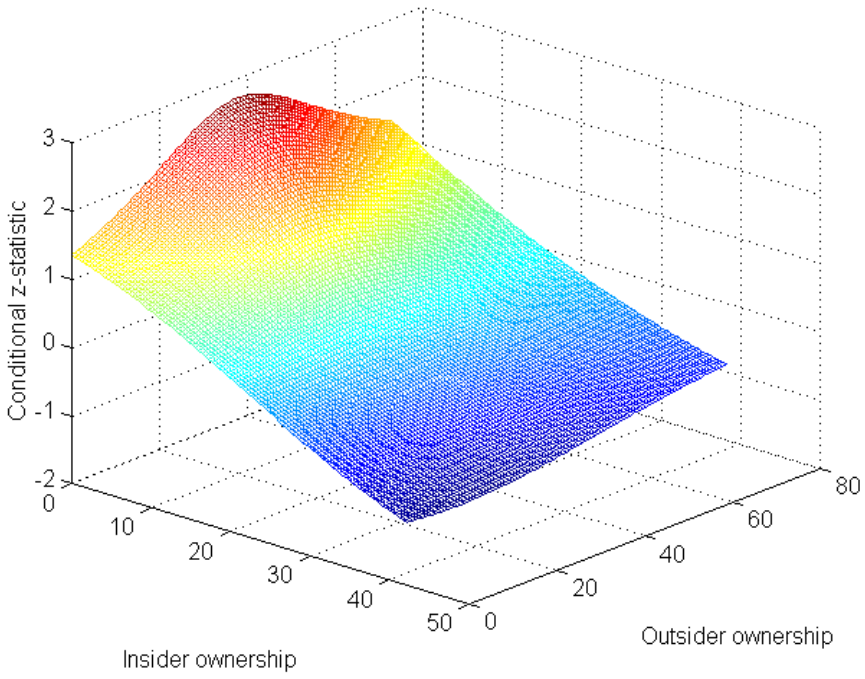


Figure 3.4. Significance of CEO turnover sensitivity with respect to the stock price-based corporate performance for various levels of ownership concentration.



Note to Figure 3.4: Values of the magnitude exceeding 1.96 are significant at 5% level (2-tail test).

CEO turnover sensitivity significantly exceeds zero for low insider ownership and strong outsider ownership of ownership structures (of about 20% and more), as exhibited in Figure 3.2. The picture of stock price performance sensitivity of turnover (Figure 3.3) shows that this sensitivity also weakens for strong insider ownership, almost irrespective of the size of outside block holdings. The conditional coefficient is significantly different from zero only up to a relatively moderate level of insider block holdings (Figure 3.4). For example, in firms where the board controls 18.6% of equity (3rd quartile) and outside block holders hold 22.8% of equity (median value), CEO is almost immune to the disciplinary turnover following bad stock performance. The conditional z-statistic for the estimate of the stock price performance sensitivity of turnover equals 0.65 only (p-value = 0.515).

In the remuneration regression equation (Panel B of Table 3.2), I find that when insiders hold large share stakes, the CEO's monetary remuneration is lower. It may be that CEOs deriving substantial wealth from their equity investment in their corporation, care less about their cash income. Still, when the firm's stock performance (abnormal return) is low and the wealth of aCEO with a large ownership stake therefore decreases,[20] the CEO is paid a relatively higher level of cash compensation. Thus, Model 3.3 implies that CEOs receive a higher monetary compensation in the wake of poor stock performance provided that they have strong voting power. It seems that managerial entrenchment not only eliminates the disciplining of poorly performing management but also introduces a pernicious remuneration incentive scheme. This finding is consistent with a recently proposed 'managerial power' approach to executive compensation (Bebchuk and Fried, 2003).

When outside shareholders hold large stakes, the monetary compensation of the CEO is lower, but as the interactive terms are not statistically significant, there is no evidence that

[20] See the interactive term of abnormal return with insider ownership in Model 3.3 (Panel B of Table 3.2).

CEO remuneration is more performance-related in outsider-dominated firms.[21] We only find partial evidence supporting Hypothesis 3.4b: strong insider or outsider control concentration leads to lower CEO remuneration. In the latter case, strong monitoring outsider shareholders may curb excessive managerial compensation, but they do not seem to impose a pay-for-performance remuneration scheme. It may very well be that pay-for-performance schemes and shareholder control are supplementary monitoring mechanisms. In the former case of strong insider ownership, the performance-based remuneration package may be less relevant as CEOs may derive substantial wealth and income from their share blocks. Still, when stock prices decrease, it seems that CEOs compensate disappointing stock returns by augmenting the cash-based compensation package.

My calculation of the conditional estimates (see Section 3.3.3) clarifies the economic significance of the above results. In a median firm, the estimates of accounting- and stock-based performance sensitivity of remuneration equal 0.00318 and 0.00184, respectively (see Model 3.3). Hence, top managers can expect their cash compensation to exceed the salaries enjoyed by industry peers by 3.18% provided that the ROA of their firms exceeds the industry median by 10 percentage points in the preceding year. Similarly, top managers can expect an increase in their industry-adjusted remuneration by 0.184% for every percentage point of increasing abnormal stock return the firm generated in the year before. In outsider-dominated firms, the conditional stock performance sensitivity of CEO remuneration rises to 0.00192 (from 0.00184 for the median firms) and is statistically significant with a z-statistic of 3.60 (p-value of 0.0003). In contrast, the conditional performance sensitivity of remuneration is not statistically different from zero for the accounting-based performance measure in firms with controlling outside shareholders (the z-statistic is 1.33 with a p-value of 0.183). Interestingly, I find the opposite results for insider-dominated firms. Comparing the stock performance sensitivity of remuneration of the median and of the insider-dominated companies, I find a

[21] An analysis of the different types of outside block holders does not give any significant results apart from the fact that CEOs' compensation is lower in firms with high ownership concentration held by institutions. This effect is not performance-related.

drop in sensitivity from 0.00184 to a mere 0.00111. The conditional z-statistic indicates that the latter number is not significantly different from zero (z-statistic is 1.55 with a p-value of 0.122). The accounting performance sensitivity of firms with insider control is statistically significant, but only weakly so. These findings are in line with Hypothesis 3.4b which states that CEO remuneration is more sensitive to stock price performance in firms with strong outside block holders whereas in insider-dominated firms, it is more sensitive to measures of accounting returns. This provides strong support to the skimming model where powerful management sets its own performance standards.

Figure 3.5 shows that accounting-based performance sensitivity of CEO monetary compensation is almost flat as a function of ownership variables. Still, it significantly exceeds zero in the case of strong insider control combined with low outsider control (Figure 3.6). Figure 3.7 confirms that the presence of large insider-controlled blocks obliterates the pay-for-stock-performance relationship for virtually all levels of outside block holdings. In firms where insiders hold more than approximately 20% of the outstanding equity, the relationship between past stock performance and monetary compensation is insignificantly different from zero, irrespectively of the outside equity concentration (Figure 3.8). One can argue that in such firms managerial incentives stem mainly from the equity holdings and the compensation would, anyway, play only a marginal role in strengthening the pay-for-stock-performance relationship.

Finally, Table 3.2 shows that the ownership dynamics is not a relevant determinant of CEO turnover (Hypothesis 3.5a) in Model 3.4 (Panel A). Contrary to what was postulated in Hypothesis 3.5b, ownership changes do not influence CEO pay (Panel B, Model 3.4).[22]

Table 3.2 also provides some interesting insights concerning the impact of firm-specific control variables (size, gearing and risk) on CEO remuneration (Panel B). In line with

[22] It should be noted that all results discussed above remain valid for a model which includes interactive terms of ownership (Model 3.3), changes in ownership (Model 3.4) and board characteristics simultaneously. The results are available upon request.

Figure 3.5. Conditional estimates of CEO monetary compensation-sensitivity with respect to the accounting-based corporate performance for various levels of ownership concentration.

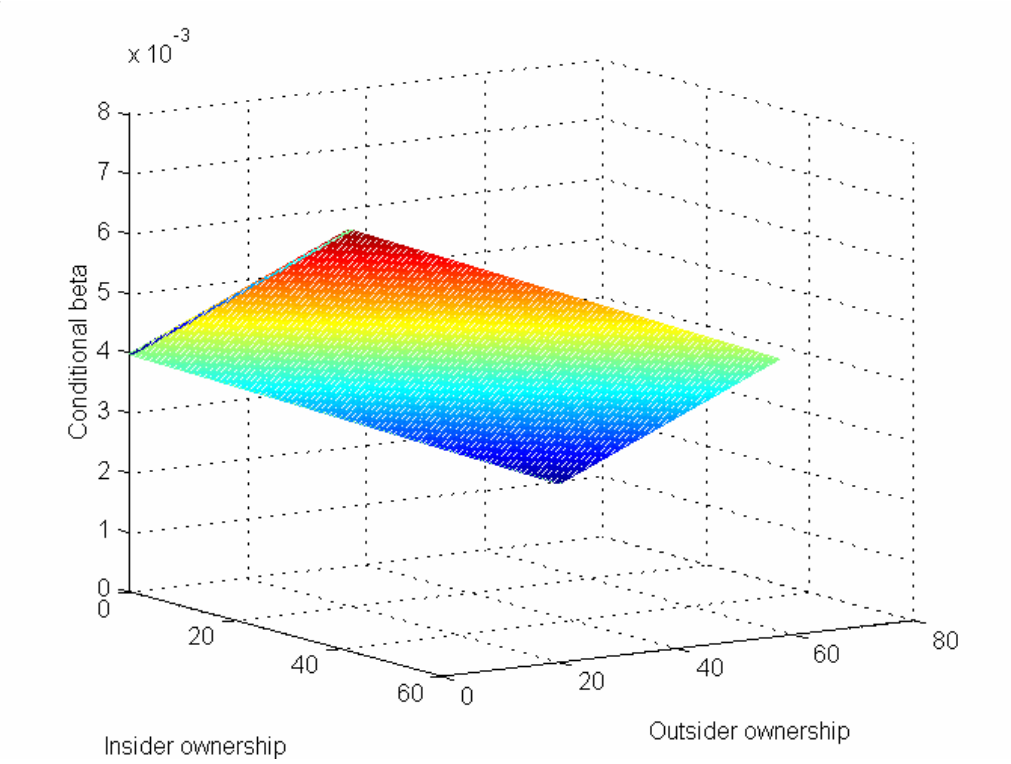
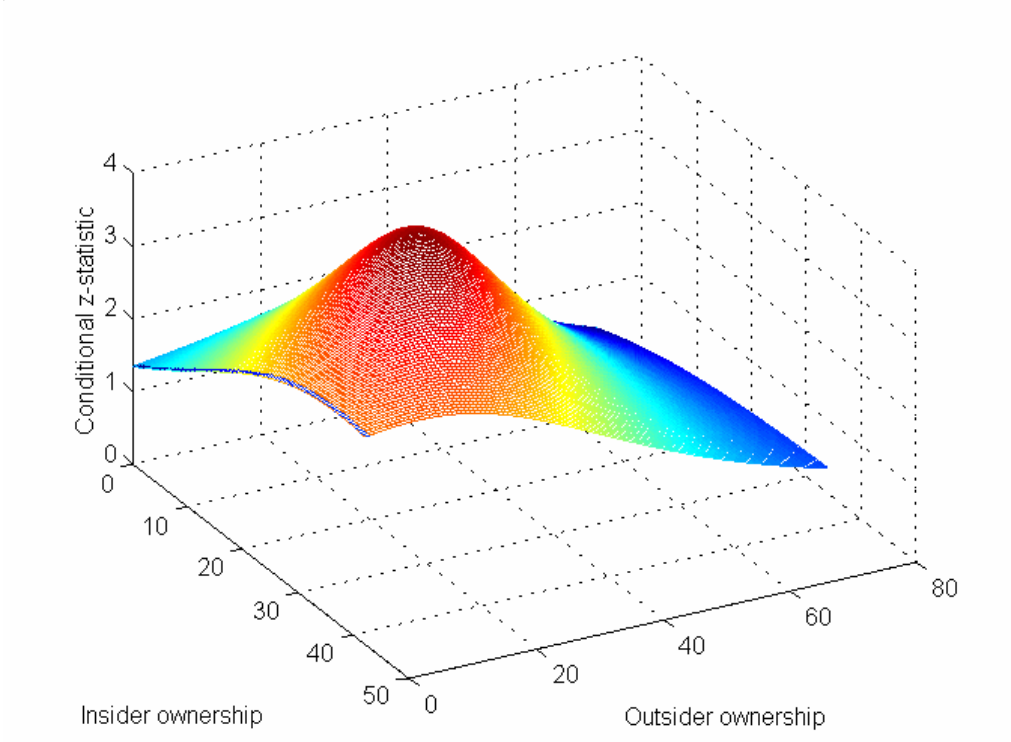


Figure 3.6. Significance of CEO monetary compensation-sensitivity with respect to the accounting-based corporate performance for various levels of ownership concentration.



Note to Figure 3.6: Values of the magnitude exceeding 1.96 are significant at 5% level (2-tail test).

Figure 3.7. Conditional estimates of CEO monetary compensation-sensitivity with respect to the stock price-based corporate performance for various levels of ownership concentration.

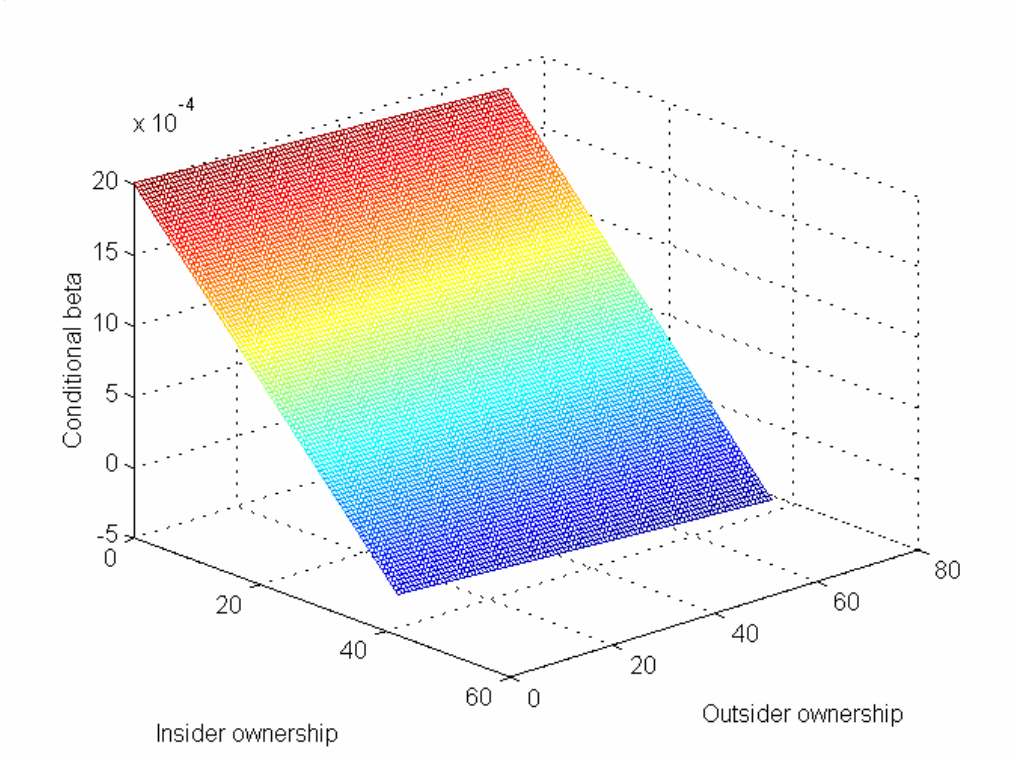
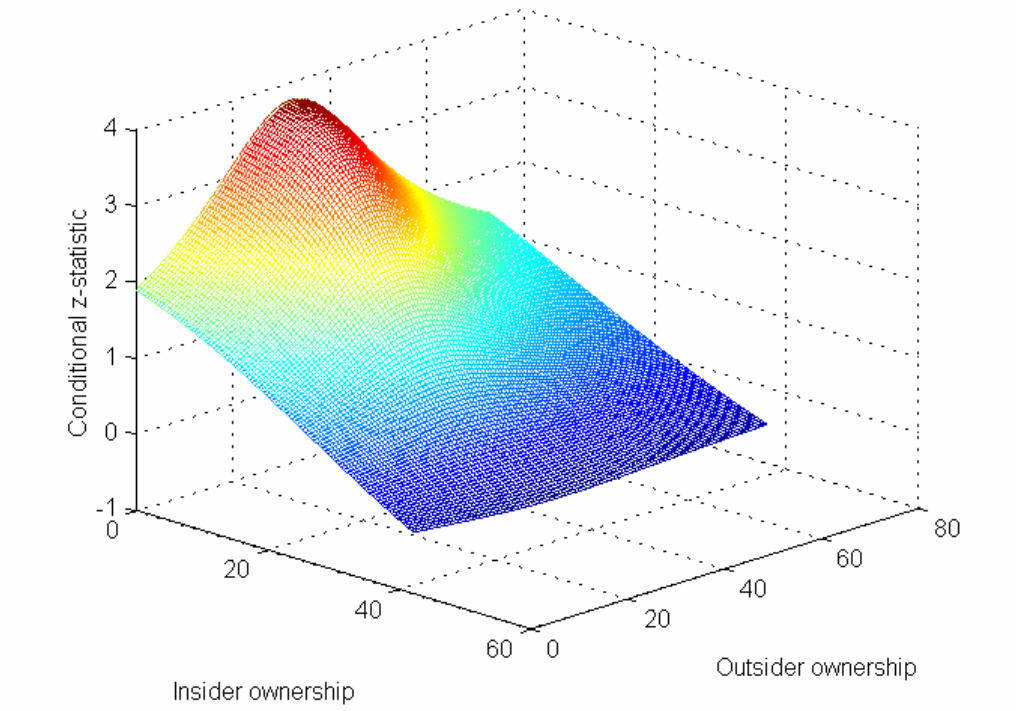


Figure 3.8. Significance of CEO monetary compensation-sensitivity with respect to the stock price-based corporate performance for various levels of ownership concentration.



Note to Figure 2.8: Values of the magnitude exceeding 1.96 are significant at 5% level (2-tail test).

the UK remuneration literature, CEOs of larger firms enjoy significantly higher industry-adjusted cash compensation. Top management usually tries to justify – rightly so or not – size-related compensation by the fact that to manage larger firms, more managerial skills are needed which are in short supply. I also document that firm leverage has no impact on compensation.

My results show that CEO remuneration increases with corporate risk. Aggarwal and Samwick (1999), and Jin (2002) argue, however, that in an agency framework, managerial risk aversion implies that firm risk moderates performance sensitivity of executive compensation. I verified this claim and expanded my models with interaction terms of company risk and performance (tables available upon request). None of these interaction terms are statistically significant, which fails to corroborate the risk hypotheses of the above studies.

As reported in Panel C, the estimate of the correlation coefficients of the error terms in the selection and the regression equations are statistically significant (Models 3.1-3.3). This result confirms that if an analysis of compensation performance-sensitivity were to be performed using a simple regression framework (OLS or fixed-effect estimations on a censored sample), such a study would likely suffer from a severe selection bias (see Section 3.3.3 above). In particular, ignoring the selectivity resulting from disciplinary CEO turnover can substantially bias the estimated strength of the remuneration rewarding effect (and of the impact of other covariates). Table 3.3 illustrates this point. It reports the estimates of panel data fixed-effect models explaining industry-adjusted CEO cash compensation for the sample of executives who are at least one year in place.[23] Models 3.5-3.8 correspond to the regression equations of Models 3.1-3.4 reported in Table 3.2.

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[23] To estimate $y_{it} = \alpha_i + X_{it}'\beta + \varepsilon_{it}$, fixed-effect and random-effect techniques are frequently used. y_{it} stands for *i*-th firm CEO compensation in year *t*. X_{it} is a vector of covariates (again for firm *i* at time *t*). α_i is a firm-specific effect characterizing *i*-th company, β is the vector of model parameters, and ε_{it} is an error term. In the fixed-effect approach, α_i's are treated as model parameters and are hence estimated. The random-effect model treats

Table 3.3 indicates that, as a consequence of ignoring the problem of sample selection, the statistical inference may lead to spurious conclusions. Based on the evidence of Table 3.3, I would reject the hypothesis predicting a significant relationship between past accounting performance and CEO compensation in Models 3.5-3.8. The significance of stock performance sensitivity of remuneration survives, but the coefficient estimates are only approximately half of the ones reported in Table 3.2 (e.g. 0.00079 in Model 3.5 as opposed to 0.00140 in Model 3.1). An analysis of the economic significance of these fixed-effect results would underestimate thetrue effect. The discrepancies between the parameter estimates obtained by two methods are even higher for some other regressors (e.g. for the firm size variable, the estimates reported in Table 3.3 are almost six times smaller than those in Table 3.2). These findings may explain the differences in conclusions between my analysis and earlier UK compensation studies (e.g. Conyon et al., 1995) and caution me interpreting the evidence on remuneration in past studies.[24]

3.4.2. Hazard rate analysis of CEO survival

Survival analysis allows me to investigate the determinants of managerial replacement and the robustness of the conclusions from the simultaneous estimation of the previous section. Using a series of Cox regression models, I confirm the strong support for Hypothesis 3.1 in Table 3.4. Previous year's poor accounting performance (measured by industry-adjusted ROA) significantly increases the likelihood of CEO removal. Although, in

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α_i's as the result of a random draw from some distribution (e.g. the normal one). For a data panel like mine (relatively large number of firms drawn randomly from an even larger population of companies), the use of a random-effect model is recommended (Verbeek, 2000), as the number of parameters to be estimated is substantially lower with this technique. Furthermore, more efficient estimates are obtained than with fixed-effect models. Still, the consistency criterion of such a random-effect approach requires α_i's to be uncorrelated with explanatory variables of the model, i.e. the X's (Baltagi, 2001). Since the Hausman specification tests points out that in almost all my specifications this assumption is violated, I report the results from the fixed-effect approach.

[24] Most past remuneration research on the UK does not find a positive pay-for-performance relation. It is likely that the reason for this lack of results follows from the fact that inappropriate econometric techniques were used.

Table 3.3. Fixed-effect panel regressions explaining CEO industry-adjusted cash compensation for censored sample (CEOs who are not newly appointed).

	Model 3.5		**Model 3.6**		**Model 3.7**		**Model 3.8**	
Panel A: Model estimates								
	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-0.50476	0.164	-0.49190	0.175	-0.45687	0.206	-0.54495	0.134
Performance indicators								
Industry-adjusted ROA in year *t*-1	-0.00006	0.923	-0.00033	0.653	0.00119	0.307	0.00085	0.390
Abnormal stock returns in year *t*-1	0.00079	0.006	0.00089	0.005	0.00099	0.007	0.00096	0.005
Board composition								
Board size	0.01739	0.789	0.01799	0.782	-0.00457	0.944	0.00631	0.923
Fraction of outside directors	0.00133	0.270	0.00146	0.230	0.00160	0.187	0.00123	0.309
CEO is the board chairman	-0.00781	0.805	-0.01275	0.688	-0.01118	0.724	-0.00601	0.850
Remuneration committee presence	-0.02152	0.440	-0.02386	0.395	-0.01463	0.601	-0.02225	0.427
Firm size, leverage, and risk								
Firm size	0.04618	0.085	0.04559	0.089	0.04585	0.086	0.04918	0.069
Capital gearing	-0.00017	0.780	-0.00012	0.842	-0.00028	0.653	-0.00018	0.770
Risk	-0.00215	0.241	-0.00216	0.241	-0.00149	0.420	-0.00114	0.552
Ownership concentration								
Herfindahl-5 concentration index			-0.62276	0.027				
Accounting perf. * Herfindahl-5 index			0.00785	0.528				
Stock price perf. * Herfindahl-5 index			-0.00229	0.453				
Insiders' block holdings					-0.00440	0.017		
Accounting perf. * insider stake					0.00002	0.764		
Stock price perf. * insider stake					-0.00001	0.427		
Outside block holdings					-0.00080	0.381		
Accounting perf. * outsider stake					-0.00008	0.049		
Stock price perf. * outsider stake					-0.00002	0.215		
Ownership dynamics								
Increase in insiders' block holdings							-0.00095	0.724
Accounting perf. * increase insider stake							-0.00006	0.676
Stock price perf. * increase insider stake							-0.00006	0.453
Increase in outsiders' block holdings							-0.00003	0.970
Accounting perf. * increase outsider stake							-0.00006	0.180
Stock price perf. * increase outsider stake							-0.00002	0.352
Year control variables								
Year dummies	Yes		Yes		Yes		Yes	

Table 3.3 - continued.

	Model 3.5	Model 3.6	Model 3.7	Model 3.8
Panel B: Model statistics and tests				
σ_α	0.532	0.523	0.507	0.532
σ_e	0.199	0.199	0.198	0.199
ρ	0.878	0.874	0.868	0.877
F-test for all $\alpha_i = 0$	F(213,539) = 11.91	F(213,533) = 11.82	F(213,530) = 11.61	F(213,533) = 11.66
P-value for F	< 0.001	< 0.001	< 0.001	< 0.001
Corr(α_i, *Xb*)	0.467	0.435	0.445	0.477
Model F-test	F(13,539) = 5.13	F(16,533) = 6.47	F(19,530) = 4.31	F(19,533) = 3.71
P-value for F	< 0.001	< 0.001	< 0.001	< 0.001
R^2 - within	0.110	0.119	0.139	0.117
R^2 - between	0.425	0.414	0.457	0.413
R^2 - overall	0.343	0.340	0.378	0.353
No. of groups	214	214	214	214
No. of observations	766	763	763	766

Note to Table 3.3: The table presents the estimates of the fixed-effect panel data model for CEO industry-adjusted compensation for a censored sample (i.e. for CEOs who were keeping their job for at least one year). The dependent variable is an industry-adjusted CEO cash compensation in a given year. As far as regressors are concerned, industry-adjusted ROA is defined as industry-year median adjusted return on equity (in percentage terms). Abnormal stock return is lagged by one year as well. Board size is defined as a natural logarithm of the total number of directors. The fraction of outside directors is expressed as a percentage of outsiders on the board. 'CEO is board chairman' is a dummy variable that equals one for CEOs serving at the same time as chairman of the board. The remuneration committee presence is a dummy variable that equals one for firm-years, when remuneration committee was in place. Firm size is proxied by the natural logarithm of the total book value of assets. Capital gearing is expressed in percentage terms. Company risk is measured as an annual volatility of stock returns. Herfindahl-5 concentration index is based on stakes of the five largest shareholders. The block holding measures represent cumulative total percentage stakes held by insiders (CEO, executive directors, non-executive directors) and outsiders (financial institutions, families and individuals, and corporations). The variables describing ownership dynamics correspond to increases (in percentage points) of cumulative stakes held by insiders (CEOs, executives, non-executives) and outsiders (financial institutions, families and individuals, and corporations).

some of the models, past stock market performance is marginally significant, it is accounting- rather than market-based performance measures that are the dominating criterion for replacing a CEO (Models 3.9-3.12).[25]

[25] All turnover figures in these models are corrected for natural turnover (see Section 3.3.2).

Table 3.4. Hazard analysis of CEO turnover.

	Model 3.9		**Model 3.10**		**Model 3.11**		**Model 3.12**	
	Dependent variable is the marginal conditional probability that the CEO is replaced in the time instant Δ given that he was not replaced up to time *t*							
	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value
Performance indicators								
Industry-adjusted ROA in year *t*-1	-0.00805	0.002	-0.01056	0.002	-0.01430	0.041	-0.00947	0.053
Abnormal stock returns in year *t*-1	-0.00563	0.082	-0.00546	0.132	-0.00532	0.178	-0.00420	0.354
Board composition								
Board size	1.50628	0.000	1.46601	0.000	1.56217	0.000	1.47911	0.000
Fraction of outside directors	0.01338	0.026	0.01259	0.041	0.01213	0.050	0.01462	0.020
CEO is also the chairman	-1.07289	0.000	-1.05769	0.000	-1.03598	0.000	-1.08703	0.000
Firm size, leverage, and risk								
Firm size	-0.08824	0.238	-0.09642	0.218	-0.14245	0.089	-0.05975	0.435
Capital gearing	0.00303	0.400	0.00287	0.455	0.00297	0.453	0.00290	0.417
Risk	0.01898	0.024	0.01733	0.050	0.01355	0.117	0.01872	0.032
Ownership concentration								
Herfindahl-5 concentration index			0.92998	0.438				
Accounting perf. * Herfindahl-5 index			0.09558	0.105				
Stock price perf. * Herfindahl-5 index			-0.00045	0.988				
Insiders' block holdings					-0.01344	0.153		
Accounting perf. * insider stake					0.00050	0.094		
Stock price perf. * insider stake					-0.00004	0.870		
Outside block holdings					0.00816	0.188		
Accounting perf. * outsider stake					0.00021	0.351		
Stock price perf. * outsider stake					-0.00002	0.888		
Ownership dynamics								
Increase in insiders' block holdings							0.02144	0.205
Accounting perf. * increase insider stake							0.00006	0.858
Stock price perf. * increase insider stake							0.00034	0.630
Increase in outsiders' block holdings							0.00866	0.385
Accounting perf. * increase outsider stake							0.00009	0.594
Stock price perf. * increase outsider stake							-0.00015	0.306
Year and industry control variables								
Year dummies	Yes		Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes		Yes	
Log-likelihood	-450.25		-440.56		-437.63		-437.91	
Wald test χ^2	$\chi^2(23) = 168.75$		$\chi^2(26) = 166.36$		$\chi^2(29) = 188.33$		$\chi^2(29) = 199.57$	
P-value for χ^2	< 0.001		< 0.001		< 0.001		< 0.001	
Pseudo-R^2	0.089		0.086		0.092		0.084	
No. of observations	1148		1136		1136		955	

Note to Table 3.4: The table presents the estimates of the Cox proportional hazard rate model for managerial tenure. Standard errors are adjusted for clustering of observations on each firm. Industry-adjusted ROA is defined as industry-year median adjusted return on equity (in percentage terms) lagged by one year. Abnormal stock return is lagged by one year as well. Board size is defined as a natural logarithm of the total number of directors. The fraction of outside directors is expressed as a percentage of outsiders on the board. 'CEO is board chairman' is a dummy variable that equals one for CEOs serving at the same time as chairman of the board. Firm size is proxied by the natural logarithm of the total book value of assets. Capital gearing is expressed in percentage terms. Company risk is measured as an annual volatility of stock returns. Herfindahl-5 concentration index is based on stakes of the five largest shareholders. The block holding measures represent cumulative total percentage stakes held by insiders (CEO, executive directors, non-executive directors) and outsiders (financial institutions, families and individuals, and corporations). The variables describing ownership dynamics correspond to increases (in percentage points) of cumulative stakes held by insiders (CEOs, executives, non-executives) and outsiders (financial institutions, families and individuals, and corporations).

Significant results, in line with those reported in Section 3.4.1, are obtained for the relationship between turnover and board characteristics. Large boards and boards with a high proportion of outside directors facilitate the removal of CEOs. Still the interactive term of the proportion of non-executive directors with performance is not significant which implies that non-executive directors who are more independent from management are not more able to discipline underperforming management.[26] When the CEO dominates the board by also holding the chairmanship, he is more likely to 'survive' longer.

Whereas total ownership concentration does not seem to influence the likelihood of CEO dismissal (Model 3.10), Model 3.11 shows that the presence of specific types of block holders determines the (non-natural) CEO dismissal. In companies where insiders hold larger a fraction of the voting rights, entrenchment is more likely, especially when these firms generate losses. The estimates imply that in an underperforming outsider-dominated firm (with both performance indicators at their 1st quartile values), the marginal probability of CEO removal is approximately 42% higher than in an underperforming firm with median ownership structure and approximately 58% larger than in an underperforming firm that is insider-dominated (see. Model 3.11). A more detailed analysis of insider ownership concentration – more specifically of that of the CEO, executive and non-executive directors –

[26] The results from the models with board interactive terms are available upon request.

reveals that the CEO's stake and its interaction terms are statistically significant. CEOs holding a large proportion of voting rights can make themselves to some extent immune to dismissal.[27]

Model 3.12 analyses the impact of ownership structure on managerial turnover from another angle, namely that of ownership dynamics rather than that of block holdings. As before, the ownership dynamics is not related to CEO turnover. The annual volatility of stock returns, my proxy for firm risk, is always significant with a positive sign, implying that top executives of high-risk firms are more vulnerable to dismissal. Finally, the other control variables (leverage and firm size) are insignificant in all the Cox models explaining CEO turnover.

3.5. Robustness tests

3.5.1. Alternative variable specifications in the simultaneous equations estimation

Remuneration

I re-estimated the models of Section 3.4.1 using the logarithm of CEO compensation rather than the logarithm of industry-adjusted CEO pay as a dependent variable in the regression equation. Such specifications failed to explain managerial remuneration, even after the inclusion of industry dummies to control for industry-specific effects. Therefore, I argue that Hypothesis 3.2 only holds for the appropriate measure of compensation. The lack of performance sensitivity of compensation found in the UK compensation literature (compare Conyon et al., 1995) may be attributable to the different variable specifications.

Corporate performance

I substituted unadjusted ROA and (yearly) changes in EBIT for the accounting performance measure and obtained similar results both in the regression and the selection equation. For two other proxies tried (adjusted and unadjusted ROE), the relation with CEO

[27] The results from this model are available upon request.

turnover and industry-adjusted compensation was not significant. An alternative measure of stock performance (dividend changes as a signal of future value) gave results similar to those obtained with stock returns. Tobin's Q correlates positively with remuneration in the regression equations, but is not a used as a benchmark to remove the CEO (selection equation).

Finally, I extended the models by also including two-year lags of the performance indicators. In most of the specifications, both accounting- and market-based proxies lagged two years appeared insignificant. Thus, it seems that the decisions to CEO removal as well as remuneration are taken swiftly, once specific performance thresholds are reached.

Ownership and control

In the selection equations, the variables measuring total ownership concentration mostly turn out to be insignificant, irrespectively of the proxy tried. Only when I employ a Shapley value of the largest block holder, which captures the relative voting power of this block holder, I obtain a positive correlation (at the 10% level) with the likelihood of CEO dismissal (Hypothesis 3.3a). In relation to the tests of Hypothesis 3.4a and 3.4b, I tried alternative proxies to measure stakes and voting power of different types of owners (e.g. the largest stake in each of the classes, Herfindahl-3 concentration indices within each shareholder class, the Shapley value for the largest block holder by shareholder classes, the Shapley values by class of owner). The results are in line with those reported in Section 3.4.1: I only find consistent support for managerial entrenchment as larger stakes controlled by insider (mainly the CEO) mitigate the likelihood of CEO dismissal.

With respect to the regression equations (on remuneration), my results appear robust to different proxies of ownership structure: total ownership concentration has no impact on the level of CEO compensation. Thus, Hypothesis 3.3b can be rejected. Replacing cumulative stakes of various classes of owners by the largest block in each of the groups, by Shapley values of the largest investor in each of the owner-type classes, by Herfidahl-3 indices for

different groups, or by class Shapley values produces results that are comparable to those reported earlier in Section 3.4.1.

Leverage

The results are also robust to the choice of leverage proxy (using book or market value) as none of the conclusions concerning the research hypotheses is challenged in alternative specifications. Extending the model specifications by adding additional firm-specific control variables capturing changes in capital structure (such as dummy variable for firms issuing new equity) does not materially affect the results.

Model extensions by CEO age

Several studies argue that CEO age is one of the crucial determinants of compensation and of turnover. I expand the models in Table 3.2 by including CEO age and find that this variable has no impact on CEO replacement but that it is positively related to CEO cash compensation. None of the other results presented in Table 3.2 are rejected. The reason why I do not present these additional results in the tables is that the CEO age variable is only available for 60% of my sample.

3.5.2. Robustness tests for hazard models

In spite of the advantages of the methodology applied in Section 3.4.2 - more specifically the fact that I do not need a full parameterization of the hazard function – I estimate panel-data fixed-effect logit models to verify robustness further. Due to the requirements of estimation procedure (i.e. conditional maximum likelihood) sample size shrinks substantially (by approximately 60%), which brings about lower levels of statistical significance. Nevertheless, the major qualitative conjectures concerning CEO turnover are upheld irrespectively of the choice of methodology.

Next, I re-estimate Cox models of Section 3.4.2 using alternative proxies for stock price performance (yearly dividend changes, Tobin's Q proxy), for accounting-based

performance (unadjusted ROA and changes in EBIT), for ownership concentration (Herfindahl-10 index, the largest block holding, Herfidahl-3 indices for each shareholder class and Shapley values of the largest shareholder of each class), for leverage (book- or market-based) and generate results that hardly differ from those presented in Table 3.4. Two-year lags of the performance variables are insignificant. Franks et al. (2001) state that new equity issues present the ideal opportunity to replace poorly performing CEOs, but I find no evidence that the dummy variable capturing the fact that a new equity issue took place, is correlated with CEO replacement.

3.6. Conclusion and discussion

In Chapter 3, I simultaneously analyze two mechanisms of the managerial labor market: CEO turnover and monetary remuneration schemes. Sample selection models and hazard analyses are applied to a random sample of 250 firms listed on the London Stock Exchange over a six-year period. My approach yields novel results (compared to earlier UK research): the managerial remuneration and the termination of labor contracts play an important role in mitigating agency problems between managers and shareholders. I find that both the CEOs' industry-adjusted monetary compensation and CEO replacement are strongly performance-sensitive. Top executive turnover is shown to serve as a disciplinary mechanism in case of corporate underperformance, whereas the level of monetary compensation rewards good past performance. I find that CEO turnover has the strongest performance-sensitivity for industry-corrected accounting measures and less strong a relation with stock performance measures. This suggests that CEOs are only dismissed at a late stage, namely when poor performance is reflected in the accounting returns. CEOs' monetary remuneration, relative to that of their industry peers, reflects both past good accounting performance and stock price performance (abnormal returns, Tobin's Q and dividend increases). Thus, my results provide strong evidence of both the disciplinary effect of turnover and the rewarding effect of monetary compensation. In contrast, past UK literature has uncovered little evidence of

performance-sensitivity which may be the result of biases introduced by inappropriate estimation techniques as well as the incorrect choice of remuneration measures and performance benchmarks. I detail that the use of Tobit-2 sample selections models generates unbiased results compared to fixed-effect panel data regressions.

I also investigate whether specific corporate governance mechanisms (different types of block holders, of boards of directors, or of leverage) have an impact on managerial disciplining or on pay-for-performance contracts. I find that neither total ownership concentration (measured by the fraction of voting rights, Herfindahl index, and Shapley indices) nor the presence of large block holdings held by outsider shareholders (institutions, families or individuals, other corporations) are related to higher CEO turnover even in the wake of poor performance. This implies that there is little evidence disciplinary monitoring by outsider shareholders. Still, there is one type of block holder that is able to impede CEO dismissal: insiders with strong voting power successfully resist CEO dismissal, irrespective of corporate performance. In an insider-dominated underperforming firm, the probability of CEO replacement is merely 11.4% whereas it is as high as 21.3% for an outsider-dominated company. This case of strong managerial entrenchment is even exacerbated when the CEO also holds the position of chairman of the board. Boards with a high proportion of non-executive directors and with separate persons fulfilling the tasks of CEO and chairman, replace the CEO more frequently, but these boards are not more apt to replace underperforming management. There is also little consistent evidence that the market in large ownership stakes and leverage influence CEO turnover.

My analysis of CEO monetary compensation reveals that CEOs are rewarded for corporate size and risk but also for good accounting and stock price performance. However, this does not mean that I support the alignment of interests-hypothesis for remuneration contracts. Quite on the contrary, it seems that the skimming model of Bertrand and Mullainathan (2000) or the managerial power model of Bebchuk and Fried (2003) sketches a better picture of the managerial remuneration practices in the UK for the following reasons.

First, CEO remuneration is sensitive to stock price performance in firms with strong outside block holders, whereas remuneration in insider-dominated firms is only sensitive to measures of accounting returns. Thus, managers with strong control concentration seem to prefer accounting standards as an evaluation criterion because they have more discretion over this benchmark and hence over their monetary compensation. In contrast, in firms with strong outsider (monitoring) shareholder, management cannot pick its preferred performance benchmark as it is required to focus on the creation of shareholder value. Second, the presence of a remuneration committee has no impact on remuneration. My results in this respect appear consistent with the widely perceived failure of this mechanism in tackling governance problems as the Financial Times (May 20, 2003) puts it: '*Ten years ago company boards set up remuneration committees to restrain greedy chief executives and make the salary setting process more transparent. Yet the excesses seem to have increased as a result. The committees create a veneer of respectability that protects chief executives from direct accountability. They rely on salary surveys and often use absurd overseas comparisons to justify huge salaries for UK-based executives. The committees generally want their chief executives to be paid an above-average wage, thereby creating an inflationary spiral… [B]ecause many chief executives sit on each other's remuneration committees, there is a suspicion of mutual back-scratching'*. Third, although one would expect that the remuneration package may be less relevant for CEOs owning substantial ownership stakes because CEOs may derive substantial wealth and income from the equity investment in their firms, I find that this hypothesis does not hold. When stock prices decrease and negative abnormal returns are incurred, I find that equity-owning CEOs compensate disappointing stock performance by augmenting their cash-based compensation package (salary and bonus). This suggests self-dealing and hence provides further support for the 'skimming' behavior of top management.

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Chapter 4

Patterns in Payout Policy of the UK firms in the 1990s

4.1. Introduction

Fama and French (2001) argue that over the last quarter of a century, US firms have become considerably less prone to distribute (excess) funds to shareholders. This decreasing propensity to pay goes hand in hand with the increasing role of repurchase plans as US firms tend to substitute dividends with share buybacks (Grullon and Michaely, 2002). As both the US and the UK belong to the same market-based corporate governance system (with a large number of listed companies, an active market of corporate control, diffuse ownership, a common law system and strong shareholder protection; La Porta et al., 2000), I investigate whether the phenomena of 'decreasing propensity to pay' and 'dividend substitution' have been confined to the US.[1] Hence, I analyze the payout evolution for a large panel of UK companies and focus on two key aspects of their payout policies. First, I examine the firms' decision whether to distribute funds. This propensity to pay is studied by analyzing time-series and cross-sectional patterns of payout. Second, I investigate the choice of the payout

[1] Needless to say, I acknowledge the existence of many institutional differences between the two countries, in particular, as far as the taxation of payout is concerned (Bell and Jenkinson, 2002; Rau and Vermaelen, 2002; Lasfer and Zenonos, 2003; Bank, 2004).

channel (i.e. dividends, repurchases, or both). Consequently, I can also verify whether UK firms substitute dividends with share repurchases (as their US peers do).

This chapter complements the existing literature by providing an extensive description of payout policies followed by UK firms in the 1990s. Although some empirical studies of the UK firms' payout behavior exist, they usually focus on one particular payout mechanism in isolation.[2] To my best knowledge, I am the first to address the earnings distribution channel choice. This chapter contributes to the literature on the methodological side as well. I advocate the use of Banzhaf indices as a relevant measure of voting power in the analysis of corporate policy choices. This study (together with the next chapter) is also the first to employ those voting control measures in the context of corporate payout policies.

An overwhelming majority of UK firms pays dividends. Contrary to the recent evidence for the US (Fama and French, 2001), UK firms do not demonstrate a decreasing propensity to distribute funds to shareholders in the 1990s. I acknowledge that this discrepancy could be partly attributed to the differences in tax systems between the two countries. However, the existence of tax clienteles cannot fully explain the difference in patterns. I also show that companies paying out funds to shareholders are usually larger, more profitable, less levered, and are growing more slowly. Additionally, they have fewer investment opportunities than their counterparts who do not distribute (excess) funds.

Whereas the role of share repurchases is gradually increasing, dividends still constitute a vast proportion of the total payout. Moreover, the repurchasing firms usually pay dividends as well. My results document a very strong relationship between the presence of block holders and the choice of the payout channel: firms with concentrated ownership tend to opt for dividends rather than share repurchases. This effect holds irrespectively of the identity of the controlling shareholder (financial institutions, directors, other individuals, industrial firms).

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[2] Bond et al. (1996), Lasfer (1996), Bell and Jenkinson (2002), Short et al. (2002), Farinha (2003), Lasfer and Zenonos (2003), Correia da Silva et al. (2004) analyze dividend policy only, while Rau and Vermaelen (2002) and Oswald and Young (2004) focus exclusively on factors determining repurchase decisions.

I argue that the presence of stringent insider trading regulation may affect the attractiveness of repurchases (as opposed to dividends) for large shareholders.

The remainder of the chapter is organized as follows. Section 4.2 surveys the relevant literature. The subsequent part describes the institutional background. Section 4.4 develops the research questions, while data and methodology are discussed in Section 4.5. Section 4.6 details the results of the analysis of payout policy in the UK. Section 4.7 summarizes additional analyses and robustness checks, while Section 4.8 concludes.

4.2. Review of literature

4.2.1. Background literature: The determinants of payout

Miller and Modigliani (1961) were the first to challenge the popular belief that higher dividend payout translates into higher firm value. Under the restrictive conditions of perfect capital markets, any mix of retained earnings and payout will not affect firm value (Allen and Michaely, 2003). In the light of this theory, it may seem surprising that firms do actually care about their payout policy (the dividend puzzle; Black, 1976). The existing literature advances several explanations for this puzzle. Various theories stipulate that factors such as taxes, information asymmetries, and contract incompleteness determine a firm's payout decision.

First, various types of investors are taxed differently and, consequently, can constitute tax clienteles. In equilibrium, firms supply stocks that minimize taxes for each of those clienteles (Miller and Modigliani, 1961). The empirical support for such a static tax clientele model appears mixed. Surprisingly, high tax-bracket individuals hold substantial amounts of dividend-paying stocks in the US (Allen and Michaely, 2003). Moreover, Richardson et al. (1986) and Michaely et al. (1995) argue that the changes in payout policies do not necessarily lead to adjustments of firm ownership structures. They find that a firm that initiates or omits a dividend experiences only a minor increase in the trading volume, which cannot be attributed to a clientele shift. Brav and Heaton (1998) and Dhaliwal et al. (1999) challenge this conclusion by documenting that significant changes in institutional and corporate ownership

arise after dividend initiations and omissions. Finally, Perez-Gonzalez (2002) documents that tax reforms in the US are followed by the changes of firms' payout policy that are consistent with tax-induced preferences of the largest shareholders. Thus, it seems that firms adjust their payout policy as a result of changes in the tax law while shareholders do not seem to rebalance their portfolios significantly by changing the proportions invested in paying and in non-paying firms.

Miller and Scholes (1978) pioneer the second generation of clientele models explaining payout policy and argue that investors can trade dynamically to reduce the tax burden associated with dividends. Kalay (1982) and Stiglitz (1983) suggest some additional dynamic tax-avoidance strategies and, consequently, claim that the possibility of dividend 'laundering' leads firms to the situation analyzed by Miller and Modigliani (1961), in which dividend policy is irrelevant. The empirical tests of dynamic clientele models usually follow the Kalay's (1982) approach and focus on trading around ex-dividend days. The support for the dynamic clientele theories appears stronger than for the static ones (Allen and Michaely, 2003). The abnormal trading activity around the around ex-dividend day is documented for countries such as the US (Lakonishok and Vermaelen, 1986; Michaely and Vila, 1995), Italy (Michaely and Murgia, 1995), Japan (Kato and Lowenstein, 1995), Sweden (Green and Rydqvist, 1999), and Germany (McDonald, 2001).[3]

Second, information asymmetries and contract incompleteness inspired another stream of the payout literature. Insiders possessing superior information about the company's prospects may want to employ the payout policy to convey this information to shareholders (Miller and Modigliani, 1961). Bhattacharya (1979), Miller and Rock (1985), John and Williams (1985) develop models that formalize the signaling theory of payout. While in the former two models dividends and share repurchases are perfect substitutes (i.e. a given amount of payout conveys the same information to shareholders, irrespectively of the payout

[3] Usually, this trading volume is positively related to the size of the dividend and negatively related to the level of transaction costs and risk.

channel choice), the model by John and Williams (1985) predicts that only dividends can convey information on firm prospects to shareholders.[4] Zeckhauser and Pound (1990) develop a model where payout policy and ownership concentration constitute alternative signaling devices.

Consistently with the signaling theories, changes in dividend policy (in particular, extreme changes, such as dividends omissions or (re)initiations) are accompanied by the stock price announcement effects (negative for omissions, positive for (re)initiations; Aharony and Swary, 1980; Asquith and Mullins, 1983; Healy and Palepu, 1988; Michaely et al., 1995; Grullon et al., 2002). Likewise, the announcements effects for share repurchase initiations are positive (Ikenberry et al., 1995). Despite this indirect support for signaling explanations of payout, Benartzi et al. (1997) argue that dividend changes are related to past rather than future earnings.[5] Nissim and Ziv (2001) show, however, that dividend changes are positively related to earnings changes over a two-year period subsequent to the dividend change.

Third, agency models stipulate that payout policy can mitigate potential agency conflicts between managers and shareholders (Rozeff, 1982).[6] Regular distributions of funds to shareholders force firms with value-enhancing investment projects to raise capital externally (Easterbrook, 1984). Consequently, firms are regularly forced to undergo the scrutiny of the market (the providers of external funds). The commitment to pay out excessive funds to shareholders reduces the amount of free cash flows that managers could otherwise spend on value-reducing projects (Jensen, 1986). However, the credibility of such a commitment may be questioned, as it is relatively easy for management to renege on payout promises. Some agency models are criticized as they assume that managers can be forced to

[4] The reason is that a signal – to be credible – needs to be costly. The signaling cost in John and Williams (1985) stems from the taxes paid on dividends (which are higher than those paid on capital gains).

[5] Moreover, Grullon and Michaely (2004) document that the announcements of open-market share repurchase are not followed by an increase in operating performance.

[6] High payout may alleviate agency problems emerging between managers and shareholders, but could induce agency problems between debt and equity holders (Jensen and Meckling, 1976; Myers, 1977). By enforcing excessive payout, shareholders may expropriate debt holders.

pay out funds, while they cannot be prevented from pursuing a suboptimal investment policy (Allen and Michaely, 2003).[7] Fluck (1999) addresses this issue and develops a model, in which the dividend payments depend on the shareholders' effectiveness in disciplining the management. Allen et al. (2000) also highlight the role of large shareholders' monitoring. Their model stipulates that the firms pay high dividends in order to attract lower-taxed investors (i.e. financial institutions) who have superior skills in detecting firm quality. Empirically, Lang and Litzenberger (1989) document that the firms that are likely to be overinvesting (i.e. the firms with Tobin's Q lower than one) experience larger appreciation/depreciation on the announcement of substantial dividend increases/decreases (as compared with other companies).[8] Likewise, Grullon and Michaely (2004) document that the market reaction to share repurchase announcements is more positive for the firms that are more likely to overinvest. Both these studies support the agency explanation of payout. Lie (2000) illustrates that firms that announce increases of regular dividends, special dividends, or self-tender offers generally have excess funds (compared to their industry peers). Moreover, the reaction to the announcement is positively related to the firm's amount of excess cash and negatively related to the firm's investment opportunities, which is again consistent with the free cash flow theory. Finally, La Porta et al. (2000) argue that only effective legal system provides shareholders with the opportunity to reduce agency costs by forcing management to pay out excess funds, and find that dividend payout is indeed higher in countries with better investment protection.

4.2.2. Background literature: The choice of payout channel

The theoretical literature attempts to answer not only the question whether or not firms should pay out funds and – if answered affirmatively – how much should be reimbursed, but

[7] Another point of criticism is that those models are not able to distinguish between share repurchases and dividends.

[8] However, Yoon and Starks (1995) challenge this result. Controlling for dividend yield and firm size, they find that the reactions to dividend changes do not differ between high-Q and low-Q firms.

also which channel (dividends, repurchases, or both) should be used to distribute earnings to shareholders. The theories relying on differential taxation of dividends and repurchases (e.g. John and Williams, 1985; Bernheim, 1991; Allen et al., 2000) imply that those two modes of payout are distinctly different and, consequently, they cannot be considered perfect substitutes.

Many signaling models acknowledge the differences between dividends and share repurchases, and, consequently, model the choice of the optimal payout channel (Ambarish et al., 1987; Ofer and Thakor, 1987; Williams, 1988; Bernheim, 1991). For instance, in Ofer and Thakor (1987), firms use both dividends and repurchases to signal their quality as neither dominates the other in all circumstances. While both dividends and repurchases force firms to incur some signaling cost (i.e. the depletion of internal capital), share repurchases constitute a stronger signal because they involve an additional cost for managers. This cost stems from the increase in risk of their portfolios, as managers usually do not tender their shares during repurchase programs.

Barclay and Smith (1988) and Brennan and Thakor (1990) use adverse selection arguments to explain firms' reliance on dividends rather than on share repurchases. When a company repurchases shares, the insiders (i.e. managers or large block holders) can exploit their informational advantage and expropriate uninformed shareholders.[9] Consequently, shareholders with low stakes prefer dividends, while those with large stakes opt for repurchases. Moreover, the optimal choice of the payout channel is a function of the amount that is to be distributed: small payouts should be made through dividends, intermediate payouts through open-market repurchases, and large payouts through self-tender offers (Brennan and Thakor, 1990).[10] Chowdhry and Nanda (1994) consider the model where there

[9] Brennan and Thakor (1990) assume a fixed cost of collecting information. Consequently, large shareholders have a greater incentive to become informed than small investors do.

[10] In the adverse selection model proposed by Lucas and McDonald (1998), small payouts are made via dividends, while large payouts are divided between dividends and repurchases. The percentage of shares repurchased increases with the size of the payout.

is a tax disadvantage to dividends and an adverse selection cost to repurchases. The model demonstrates that the optimal payout policy involves distributing some funds in the form of dividends and retaining the remainder until future periods. However, if the management believes that the firm is sufficiently undervalued, all the accumulated cash should be disbursed through a stock repurchase.

The existence of institutional constraints (such as the so-called 'prudent man' regulations) leads to situations where portfolios of particular investors (e.g. pension funds) are tilted towards a particular group of securities, for instance dividend-paying stocks, equity index constituencies, A-rated stocks, etc. (Del Guercio, 1996). Brav and Heaton (1998) illustrate that after the introduction of the prudent man laws in 1974, US institutional investors tend to sell the stock following a dividend omission. Some UK financial institutions demand that the companies they invest in maintain the dividends even in the wake of shrinking profits (Correia da Silva et al., 2004).

Shefrin and Statman (1984) propose a behavioral explanation of (individual) investors' preference for dividend-paying stocks. Their model is based on the psychological theory of self-control (rather than on neoclassical assumptions of value-maximizing behavior of the agents) and stipulates that by receiving money in form of dividends (rather than capital gains), people avoid having to make decisions about how much to consume. This benefit could be large enough to offset disadvantages of dividends such as e.g. unfavorable taxation. Graham and Kumar (2004) document that the preference for dividends is strongest among older and less wealthy individuals. The survey by Brav et al. (2003) illustrates the managers' belief that the policy of paying out funds attracts both institutional and individual investors in the US. Baker and Wurgler (2004a, 2004b) argue that if investors' demand for stocks is affected by sentiment, the possibility of a nontrivial dividend premium exists, and thus dividend policy can be a relevant for the firm value. The authors claim that companies cater to the preferences of investors and pay dividends in periods when the valuation of dividend-paying firms exceeds that of non-paying ones.

The existing literature advances also some additional explanations for the presence of share repurchases. Managers may have incentives to switch from dividends to share repurchases if their stock option plans are not 'dividend protected' (Lambert et al., 1989).[11] Jagannathan et al. (2000) claim that dividends are paid by companies with higher 'permanent' operating cash flows, while repurchases are used by firms with higher 'temporary', non-operating cash flows. Since repurchases offer more financial flexibility, they are used by firms with more volatile cash flows.

4.3. Regulation, taxes, and payout in the UK

4.3.1. Dividends and taxes

Some aspects of the tax code affect the choice of the payout channel (dividends vs. repurchases) and, consequently, may account at least partly for the discrepancies in the observed patterns of payout between UK and US firms (Bank, 2004). In the context of the payout policy, the most important difference between these countries pertains to the tax treatment of various sources of income. The US has a classical company tax system whereby companies are taxed separately from their shareholders (Short et al., 2002). In that system, dividends are essentially taxed twice: a first time by the corporation tax on firms' profits and a second time by the income tax on shareholders' dividend income. Consequently, both basic and high rate income tax payers would prefer profits to be retained in the firm rather than to be paid out in dividends. Tax-exempt individuals are expected to be indifferent between dividends and retained earnings.

In contrast, the UK has used a partial imputation system since 1973. In that system, part of the firm's payment of corporation tax is taken into account when calculating shareholder's liability to income tax on company dividends. Hence, the tax treatment of

[11] In the UK this argument may not be very relevant, since the repurchased shares have to be cancelled and (unlike in the US) they cannot be held as treasury stock and reissued to executives later (Rau and Vermaelen, 2002).

dividends is more favorable than in a classical tax system (Bond et al., 1996; Bank, 2004). Consequently, tax-exempt shareholders prefer dividends to retained earnings; corporations and basic rate taxpayers are neutral with respect to dividends and retentions, whilst only the highest tax-bracket investors prefer retentions to dividends (Bell and Jenkinson, 2002; Short et al., 2002).[12]

Under the UK imputation tax system, the company pays a shareholder a cash dividend net of imputed amount. When the dividend is paid out, the company also pays the Advance Corporation Tax (ACT) to the Inland Revenue Service. The amount of ACT paid is equal to the gross dividend times the imputation rate.[13] It represents an advance payment against the firm's total corporation tax for a given year. The shareholder receiving the net cash dividend also receives a tax credit (equivalent to the basic rate of income tax on dividend), which can be used to offset his or her income tax liability (Short et al., 2002). A particular feature of the UK imputation system was that until July 1997, tax-exempt investors (mainly pension funds, but also charities) could claim a full cash refund of tax credits from the tax authorities.[14] This created a strong preference for earnings to be paid as dividends rather than to be retained in the company (Bond et al., 1996). The 1997 tax reform, while preserving the general imputation principle, withdrew the ability of tax-exempt investors to reclaim dividend tax credits. Consequently, valuation of the dividend income for tax-exempt investors was sharply reduced (by 20%), leaving them indifferent between dividends and retained earnings (Bell and Jenkinson, 2002).

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[12] Bell and Jenkinson (2002) argue that the effective capital gain tax rates are much lower than the statutory ones (because of deferral, general allowances, and inflation indexation). This implies that most categories of investors were actually indifferent between different sources of income (dividends vs. capital gains) both before and after the 1997 tax reform.

[13] Prior to March 1993, the imputation rate was equal to the basic rate of income tax. From March 1993, the rate of imputation has been 20% (Short et al., 2002).

[14] However, the tax code limited the possibilities of tax-exempt investors' engagement in dividend capture strategies (such as those prescribed by dynamic clientele models of payout). Tax-exempt investors could claim the full amount of the tax credit associated with dividends only if they held the shares for at least 30 days before dividend was paid.

4.3.2. Tax treatment of share repurchases

In the UK, the imputation principle does not only have consequences for dividends, but it also affects some repurchase plans. The distinction between an off-market repurchase (such as a repurchase tender offer or a private repurchase) and an open-market repurchase has a substantial bearing on the tax treatment of buyback programs (Rau and Vermaelen, 2002; Oswald and Young, 2004). In the first case, a shareholder who sells the shares is aware that he is selling to the corporation, while in the second case he is not. In the latter case, no tax credit can be claimed and the profit made on the share sale is taxed as capital gains. Consequently, the relative attractiveness of dividends (as opposed to open-market repurchases) depends on the investor's capital gains tax liability. It can be shown that all the investors but the highest tax-bracket individuals would prefer dividends to open-market repurchases.

The tax treatment of off-market share repurchases is particularly attractive for individual investors. In case of this type of repurchases the imputation rule applies and shareholders receive tax credit on the 'distribution element' of share buybacks. The distribution element is defined as the difference between the market value of the repurchased shares and the book value of the corresponding paid-in-capital. Moreover, the difference between the original subscription price and the investor cost base (i.e. the price at which he purchased the share plus an inflation allowance) is considered a capital loss (Rau and Vermaelen, 2002).[15] Such a loss is subject to the ordinary income tax and can only be offset against capital gains. As a result, in the analyzed period, individuals would prefer off-market share buybacks to dividend payment as long as they are not liable for capital gains taxes. This preference is the strongest for the low tax-bracket individual shareholders.

The tax treatment of repurchases in the UK changed several times in the 1990s, affecting the relative attractiveness of off-market share repurchases for tax-exempt shareholders (Oswald and Young, 2002). While until July 1, 1997, tax-exempt investors

[15] In a typical case, the paid-in-capital (i.e. the original subscription price) is lower than the investors cost base. Consequently, the difference between the original subscription price and the investor cost base is likely to be negative.

preferred dividend payments to any form of share repurchases,[16] the elimination of the right to reclaim dividend tax credits after this date has made those investors indifferent between dividends and share repurchases, as it is the case in the US (Rau and Vermaelen, 2002).

4.3.3. Other legal aspects of share repurchases

Regulatory aspects other than taxation can also influence the choice of the payout channel. In order to prevent companies from manipulating their stock prices, the Listing Rules of the London Stock Exchange stipulate that larger buybacks (i.e. those where 15% or more of the equity capital is to be repurchased within 12 months) must be made via a tender offer to all shareholders. Such a tender offer should have a fixed or a maximum price and be publicly announced. Smaller repurchases can be made through the stock market, provided that the price is not more than 5% above the average market price of the shares for the 10 business days preceding the repurchase (Goergen and Renneboog, 2001).[17]

Some other restrictions apply to repurchases, which further constrains the choice of payout channel. Only the 'distributable profits' or proceeds of a fresh issue of shares (made for the purpose of the repurchase) can be used to finance a buyback. Moreover, companies are

[16] Until October 7, 1996, tax-exempt investors who sold the shares in an off-market repurchase could recover tax credits from the Inland Revenue Service. However, after the Reuters large-scale repurchase of 1993, granting of such a credit was not guaranteed and was subject to tax anti-avoidance rules. As a response, in September 1994, investment bankers invented an agency buyback, in which investors were selling their shares to a broker acting as an agent for the company. Agency buybacks resemble off-market repurchases, since the agents usually contacted key investors (e.g. pension funds) in advance and gave them priority over other shareholders groups. The off-market nature of the agency buyback provided the tax-exempt investors with the opportunity to claim a tax credit on distribution. Since all the investors appeared able to participate in an agency buyback, it was easier to convince the Inland Revenue that the anti-avoidance rules do not apply. This explains the relative attractiveness of the agency buybacks (as opposed to off-market tender repurchases). The agency buyback tax loophole was abolished on October 8, 1996. Additionally, following this change in the tax code, tax-exempt investors could no longer recover tax credits associated with the distribution element of the off-market repurchase. Consequently, on-market and off-market repurchases became equally unattractive (as compared with dividends) for those investors.

[17] Still, despite those restrictions and less favorable tax treatment of on-market repurchases (as opposed to off-market buybacks), most of the repurchases effectuated in 1990s were made via the on-market channel (Rau and Vermaelen, 2002).

not allowed to repurchase shares during periods when officers and directors are not allowed to trade in their company's shares.[18] This restriction substantially reduces the role that repurchases may have in signalling firm prospects (Rau and Vermaelen, 2002).

4.4. Research questions

Fama and French (2001) conclude that in the late 1990s in the US, there were fewer dividend-paying firms than in the 1970s. They acknowledge that although changing characteristics of the population of listed firms explain part of the decline in the number of dividend-paying firms, this explanation cannot account for the overall magnitude of the effect. Moreover, the increasing popularity of share repurchases is unlikely to compensate the decline in dividend payout, as buybacks are more prevalent among dividend-paying firms. Baker and Wurgler (2004a) argue that the decrease in the firms' propensity to pay can be explained by the catering theory of dividends (Baker and Wurgler, 2004b). For several reasons (e.g. clientele effects, transaction costs, sentiment) investors prefer dividend-paying stocks in some periods, and are ready to pay a premium for these stocks.[19] De Angelo et al. (2004) point out that the firms that cease to pay dividends are usually those which used to pay very small dividends anyway, while the real payout from the top payers increases considerably. The latter effect is shown to be sufficiently strong to offset the former one: the aggregate real dividends paid by US industrial firms increased between 1978 and 2000.

It is worthwhile to examine whether the phenomenon of the decreasing propensity to pay is confined solely to the US corporate setting. While both the US and the UK belong to

[18] As a result, repurchases are not allowed in the 2-month period preceding the publication of annual earnings or semiannual earnings and in the month before the publication of quarterly results. Moreover, the company cannot purchase shares when the directors are in possession of unpublished, price-sensitive information (Fidrmuc et al., 2004).

[19] Baker and Wurgler (2004a) show that, as of 1978, the dividend premium (as measured by the difference in the average market-to-book ratios between dividend-paying and non-paying firms) is negative in all years but one. Thus, in order to cater to this shareholders' preference for non-paying stocks, firms tend to abandon dividend payments.

the same market-based corporate governance system (with a large number of listed companies, an active market of corporate control, diffuse ownership, a common law system and strong shareholder protection; La Porta et al., 2000), many institutional differences exist between these two countries (see Section 4.3). It may affect investors' preferences and, consequently, account for some cross-country discrepancies in companies' payout behavior.

As share repurchases may substitute for dividends (Grullon and Michaely, 2002), I attempt to disentangle the effects of changing propensity to pay dividends and changing propensity to pay out funds at all (either via dividends or share repurchases).

Question 4.1a (Changing propensity to pay dividends): *Does the proportion of dividend-paying firms decrease over time?*

Question 4.1b (Changing propensity to distribute funds): *Does the proportion of firms reimbursing funds (either via dividends or via repurchases) decrease over time?*

Bearing in mind that the trends in the number of paying firms and the changes in the amounts paid out may diverge (as pointed out by De Angelo et al. 2004), I also examine how the amounts distributed to the shareholders change over time.

Question 4.2a (Changing amount of dividends): *How does the amount of dividends paid change over time?*

Question 4.2b (Changing amount of total payout): *How does the total amount distributed to shareholders change over time?*

I also investigate the choice of the payout channel (dividends, repurchases, or a combination). Grullon and Michaely (2002) document a gradual tendency of US firms to substitute dividends with share repurchase plans. Recently, the popularity of share repurchases in the US has increased considerably (Fama and French, 2001). In the late 1990s, the amount spent by American companies on repurchasing their shares had risen to nearly half of the total payout (Dittmar and Dittmar, 2002). I explore whether UK firms also tend to switch from dividend payout to share repurchases.

Question 4.3a (Substitution – frequencies): *Is the ratio of repurchasing to dividend-paying firms increasing?*

Question 4.3b (Substitution – amounts paid): *Do share repurchases constitute a growing proportion of the total payout?*

Theoretically, one of the main determinants of the payout channel choice is ownership structure. A first reason why ownership may be important is that some features of the UK tax code may influence investors' preferences for dividends over share repurchases (and capital gains) and vice versa (for a detailed discussion of the tax issues related to payout policy, see Section 4.3). In this chapter, I focus on static tax clienteles, as a model with dynamic tax clienteles is unlikely to be relevant in the UK context.[20] Bell and Jenkinson (2002) argue that the class of the tax-exempt investors (mainly pension funds) is the largest category of shareholders in the UK, which basically precludes them from pursuing dividend capture strategies. Moreover, the tax code limits the possibilities to engage in such activities (see Section 4.3.1).

Second, clientele effects may also result from factors other than tax regulations. Asset-liability management considerations and the existence of 'prudent man' rules may lead to situations where institutional investors strongly prefer a particular form of payout (Del Guercio, 1996). For instance, Michael McLintock, the CEO of M&G (which is part of Prudential, one of the most important institutional investors in the UK) wrote a letter to the major UK companies in 2002 arguing that '*the investment case for dividends in the majority of circumstances is a strong and well supported one, has stood the test of time, and is likely to be increasingly appreciated in the economic and stock market conditions which we seem likely to face for the foreseeable future'* (Correia da Silva et al., 2004). Additionally, various behavioral arguments can also be invoked to explain individual investors' preferences for dividend-paying stocks (Shefrin and Statman, 1984; Graham and Kumar, 2004). For instance,

[20] Lasfer and Zenonos (2003) support this claim and provide indirect evidence of little short-term trading activity around the ex-dividend day in the UK.

such shares allow investors to adopt a simple heuristic '*consume from dividend and keep principal intact*' – the rule that is consistent with regret avoidance.

If the type of shareholder matters, I expect that financial institutions prefer dividends for reasons of asset and liability management of their portfolios. Of the institutions, I expect that pension funds exhibit an even stronger preference for dividends for tax reasons (see Section 4.3). Directors prefer share repurchases for tax reasons.[21] Still, if wealth diversification is important to them, they may prefer dividends as share repurchases may trigger an unwanted negative signal to the market as a result of the disclosure regulation of directors' dealings.[22] Likewise, I expect outside block holders like industrial companies, individuals, and families to prefer share repurchases for tax reasons. Contrarily, if block holders wish to avoid the negative market signal of selling through a share repurchase plan, they may prefer dividends over share buybacks.[23]

Question 4.4a (Shareholder identity effect): *Does the identity of the largest shareholders affect the firm's choice of the payout channel?*

[21] Directors are assumed to be in the highest bracket of income tax.

[22] In order to actively participate in an open-market share repurchase program, managers would have to liquidate part of their equity stake. In the UK, such a transaction, like all the directors' dealings (irrespectively of their size), is subject to a mandatory disclosure (Goergen and Renneboog, 2001). The equity sale by managers may be interpreted by the market as an adverse signal about the firm's prospects (Gregory et al., 1997; Fidrmuc et al., 2004), and could negatively affect the value of the remaining managerial holdings. Obviously, a pro-rata dividend does not suffer from such a disadvantage.

[23] If dispersed shareholders believe that a large block holder has superior information about the firm's value, they may consider an equity sale by such a block holder as bad news about the firm's value (Brennan and Thakor, 1990). If such a sale is large enough, it has be disclosed: in the UK, a shareholder who is not a director and whose stake exceeds 3% of the equity outstanding has to disclose increases or decreases of his stake, if the change exceeds 1%. Moreover, when the investor's stake drops below the 3% threshold, he must notify the company. Subsequent decreases do not require a notification (Goergen and Renneboog, 2001).

If block holders have a major impact on the firm's payout policy, the question arises whether it is the largest block holder or a coalition of block holders (with similar preferences) who influence the choice of the payout channel.[24]

Question 4.4b (Shareholder power effect): *Does the voting power of the leading shareholders affect the firm's choice of the payout channel?*

Finally, Fama and French (2001) document systematic differences between the samples of paying and non-paying companies with respect to characteristics such as firm size, growth, investment opportunities, leverage and profitability. As those variables are likely to influence both the firms' propensity to pay and the choice of the payout channel, I incorporate them in my models.

4.5. Data and methodology

4.5.1. Sample selection

My sample covers British firms listed on the London Stock Exchange. I exclude banks, insurance companies, and other financial firms (SIC codes 6000-6900) because their financial reporting standards are different from those of the rest of the sample. I also exclude utilities (SIC codes 4900-4949), because their payout policies and the access to external financing are regulated. Finally, I only retain those firms that are present in the Worldscope Disclosure dataset for at least three years in the period 1992-1998. As a result, I am left with the sample of 985 firms that covers more than two thirds of the UK listed non-financial firms and represents a broad range of industries.[25] I use the Worldscope database to gather ownership and control data as well as accounting data.

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[24] Moreover, some adverse selection models (e.g. Brennan and Thakor, 1990) stipulate that ownership concentration *per se* affects the optimal choice of the payout channel.

[25] The sample includes 206 agricultural, mining, forestry, fishing and construction firms (SIC codes 1-1999), 407 manufacturing firms (SIC codes 2000-3999), 204 retail and wholesale firms (SIC codes 5000-5999) and 168 service firms (SIC codes 7000-8999).

Table 4.1. Sample characteristics.

Panel A: Summary statistics for pooled sample (5547 firm-years)

	Mean	Median	St. dev.
Market value of the firm	503325	72755	2476283
Book value of the total assets	301153	43468	1445710
Profitability	8.15%	9.92%	19.65%
Tobin's Q proxy	1.872	1.451	1.841
Asset growth	14.47%	3.72%	91.87%
Leverage (book-value)	59.09%	55.50%	40.22%
Leverage (market-value)	39.78%	37.28%	20.69%

Panel B: Year-by-year averages

	1992	1993	1994	1995	1996	1997	1998
Market value of the firm	475656	496099	468219	529338	528477	546605	379361
Book value of the total assets	319035	311141	301825	319527	294670	292552	198632
Profitability	NA	7.16%	8.12%	7.81%	8.12%	9.11%	9.26%
Tobin's Q proxy	1.503	1.790	1.771	1.954	2.108	1.967	2.123
Asset growth	NA	17.37%	13.99%	15.57%	13.45%	14.04%	8.21%
Leverage (book-value)	59.35%	57.05%	57.39%	59.52%	60.57%	60.34%	59.02%
Leverage (market-value)	45.73%	38.80%	38.88%	39.44%	37.84%	39.16%	38.45%

Panel C: Year-by-year medians

	1992	1993	1994	1995	1996	1997	1998
Market value of the firm	49492	61306	68991	74827	87843	91084	94462
Book value of the total assets	36180	36550	40783	45230	46824	51280	54360
Profitability	NA	8.56%	9.79%	10.09%	10.25%	10.73%	11.53%
Tobin's Q proxy	1.268	1.485	1.455	1.477	1.551	1.457	1.386
Asset growth	NA	1.80%	6.31%	5.51%	1.54%	3.09%	3.49%
Leverage (book-value)	54.99%	53.59%	54.54%	55.99%	56.82%	56.16%	55.23%
Leverage (market-value)	43.42%	35.53%	36.96%	37.24%	36.00%	37.48%	35.35%

Note to Table 4.1: All the values are expressed in constant 1992 prices. Market value of the firm and book value of the assets are measured in £ thousands. Profitability is defined as return on assets (i.e. the ratio of EBIT to the average of the total assets at the beginning and the end of the year). Tobin's Q proxy is defined as the market-to-book ratio. Asset growth is the growth rate of the total assets. Leverage (book-value) is defined as the ratio of total debt to the book value of the total assets and is measured at the end of the year. Leverage (market-value) is defined as the ratio of total debt to the market value of the firm and is measured at the end of the year.

Table 4.1 summarizes the key characteristics of the sample firms. As shown in Panel A, the average (median) market value of the sample firm equals £ 503m (£ 73m),[26]

[26] All the values are expressed in constant 1992 prices. Inflation-adjustment is based on Datastream CPI data.

while the average (median) book value of the firm's total assets amounts to £ 301m (£ 44m). The distributions of both variables are highly skewed – the respective mean and median values differ substantially and the standard deviations are high. The return on assets in the average (median) firm equals 8.15% (9.92%). As illustrated by Panels B and C, this profitability indicator improves slightly towards the end of the sample. The average (median) value of the Tobin's Q proxy equals 1.872 (1.451), while the average (median) rate of asset growth amounts to 14.47% (3.72%). Finally, in the average firm, the leverage (expressed in book-value terms) equals 59.09%, while in the median firm the corresponding number is 55.50% (for market value-based quantities, the numbers equal 39.78% and 37.28%, respectively). The leverage indicators remain relatively stable over the sample period.

I classify shareholders controlling the equity blocks into 6 mutually exclusive categories: (i) executive directors and their families, (ii) non-executive directors and their families, (iii) individuals and families not related to directors, (iv) the government,[27] (v) financial institutions (i.e. banks, insurance companies, investment and pension funds), and (vi) other industrial and commercial companies. To distinguish more than 5000 insider and outsider individual shareholders, I consult the London Stock Exchange Monitor and the Who's Who-guides. To identify institutional shareholders, I consult Datastream and Institutional Investors Annual Guides.

Table 4.2 reports that domestic financial institutions own over a half of the equity issued by UK firms. In particular, tax-exempt domestic pension funds are the largest category of shareholders in the UK throughout the 1990s. Moreover, in addition to the direct contributions to pension funds, over a half of premium income of insurance companies represents contributions to pension schemes (Bell and Jenkinson, 2002). Finally, albeit a

[27] State ownership is negligible in the analyzed sample. Across all the sample firm-years, I encountered only 22 observations (in 14 firms) where the government was a block holder. The largest stake held by the State was 13.1% of equity only. Given the marginal nature of governmental ownership, I do not report this category of shareholders in subsequent sections.

Table 4.2. Ownership of the UK listed companies (% of the total value of equity held by different categories of shareholders).

	1992	1993	1994	1995	1996	1997	1998
Individuals	20.00%	17.44%	20.14%	NA	NA	16.45%	16.66%
Charities, churches, etc.	1.79%	1.55%	1.29%	NA	NA	1.91%	1.36%
Insurance companies	19.11%	19.76%	21.78%	NA	NA	23.55%	21.63%
Pension funds	31.82%	31.09%	27.59%	NA	NA	22.05%	21.65%
Investment trusts	2.04%	2.45%	1.95%	NA	NA	1.91%	1.93%
Unit trusts	6.06%	6.52%	6.75%	NA	NA	6.71%	3.03%
Banks	0.48%	0.58%	0.39%	NA	NA	0.06%	0.56%
Other financial institutions	0.43%	0.56%	1.28%	NA	NA	2.04%	4.05%
Private non-financial institutions	1.80%	1.45%	1.13%	NA	NA	1.17%	1.39%
Central government	1.80%	1.26%	0.76%	NA	NA	0.09%	0.09%
Public sector	1.80%	1.26%	0.76%	NA	NA	0.09%	0.09%
Foreign ownership	12.87%	16.10%	16.19%	NA	NA	23.97%	27.57%

Note to Table 4.2: The numbers are calculated on the basis of the results of surveys on the ownership of UK firms carried out by Central Statistical Office. The surveys for 1995 and 1996 were not carried out.

minor class of shareholders in terms of ownership concentration, charities also enjoy tax exemption. Consequently, tax-driven preferences of investors can be expected to have a non-trivial impact on the choice of payout policy in the UK.

As the complete firm-level data on ownership is not available and as only the large shareholders are expected to be able to influence the payout decision, I focus on share block holdings (larger than 5% of equity only) to examine the relationship between ownership structure and payout variables. Table 4.3 illustrates that the concentration and structure of block holdings is relatively stable over time. The data on block holdings closely follow the patterns illustrated for all the share holdings (see Table 4.2). Financial institutions are by far the most important category of block holders. In a median company, institutional block holders control about one sixth of the equity outstanding. Different groups of individuals (directors and outside individuals) own a substantial proportion of share blocks, while the size of block holdings controlled by industrial firms is considerably smaller.

Table 4.3. Fraction of equity held by different categories of block holders in the sample firms.

Panel A: Summary statistics for pooled sample (5547 firm-years)

	Mean	**Median**	**St. dev.**
Executive directors	10.00%	0.00%	17.40%
Financial institutions	18.99%	16.15%	16.70%
Industrial firms	4.05%	0.00%	11.32%
Non-executive directors	1.67%	0.00%	6.08%
Outside individuals	2.31%	0.00%	6.49%

Panel B: Year-by-year averages

	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Executive directors	12.09%	11.27%	10.43%	9.58%	8.94%	8.30%	9.63%
Financial institutions	18.29%	17.39%	18.28%	19.05%	19.36%	20.96%	19.95%
Industrial firms	4.24%	4.23%	3.80%	4.05%	3.89%	4.27%	3.37%
Non-executive directors	1.67%	1.58%	1.76%	1.71%	1.65%	1.70%	1.55%
Outside individuals	2.53%	2.43%	2.12%	2.23%	2.24%	2.26%	2.56%

Note to Table 4.3: Table is based on data on blocks exceeding 5% of the equity outstanding.

4.5.2. Measurement of voting power

The analysis of the relationship between payout policies and ownership structures of the companies necessitates the construction of variables measuring voting power for different types of shareholders. I follow the Crespi and Renneboog (2003) approach and analyze a two-stage voting game. I assume that in the first stage, all the shareholders of a particular type (e.g. all financial institutions) form a coalition. Only in the second stage, such coalitions participate in a voting game with the intention to influence (or even to determine) the payout policy. The two-stage approach advocated here is relevant in the context of payout decisions due to the existence of different clienteles. For instance, financial institutions may prefer a particular pattern of payouts (e.g. regular dividends every year due to tax asset-liability management considerations), while other groups of owners may care less about it. The same argument can be invoked to motivate the two-stage approach in explaining the firms' choice between the two distribution channels: dividends and share repurchases. Some groups of

investors may strongly prefer one method of payout to the other because of the tax considerations, insider trading regulations, etc.[28]

The measurement of voting power is a topic of an ongoing methodological debate in game theory and corporate finance (Felsenthal and Machover, 1998; Leech, 2002). Examples of measures used in the literature include Banzhaf indices (Banzhaf, 1965; Dubey and Shapley, 1979) and different versions of Shapley values (Shapley and Shubik, 1954; Milnor and Shapley, 1978). Despite the recent popularity of Shapley values in empirical corporate finance research (e.g. Eckbo and Verma, 1994; Crespi and Renneboog, 2003), Leech (2002) argues that the underlying notion of power (i.e. P-power, or power as the prize in a voting game) appears inappropriate in the analysis of shareholder voting behavior. Instead, he argues that shareholder voting games can be better described by policy-seeking motives (rather than office-seeking motive implicit in Shapley values) and I-power[29] measures are more relevant in such a context. This is particularly important in an analysis of payout choices, which, by their very nature, have a character of policy decision.

The most frequently used measures of voting power for such games are Banzhaf (1965) values. Following Felsenthal and Machover (1998), I compute two types of measures – absolute and relative Banzhaf indices.[30] The analyzed game can be considered an oceanic one[31] and, therefore, in calculations I employ the generalization of Banzhaf value proposed by Dubey and Shapley (1979). Under some regularity conditions, Banzhaf indices in an oceanic

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[28] In the extensions of my models (in Section 4.7.1), I consider also one-stage voting games, i.e. games where type-based coalitions are not formed and where each shareholder is assumed to be a separate player in the voting game.

[29] According to this notion, power is defined as the ability to influence the decision (i.e. the outcome of the vote), but it is not interpreted as the prize in a voting game (Felsenthal and Machover, 1998).

[30] Relative indices are obtained by normalizing the absolute ones. As a result of this normalization, relative Banzhaf indices for a game sum up to 1.

[31] In game theory, oceanic games involve a few relatively large players and a continuum of infinitesimal players (Milnor and Shapley, 1978). As documented above, most of the UK companies have a few block holders, while the remaining shareholdings are widely dispersed. Hence, I consider an oceanic representation to approximate the actual distribution of votes reasonably well.

game can be obtained as the Banzhaf indices for the modified, finite game consisting only of the major players with an appropriate adjustment of the required majority threshold.

A naïve, yet quite often followed in the literature, approach is to use just the size of the stakes controlled by different block holders (or their coalitions) instead of invoking game-theoretical solution concepts. Those stakes are assumed to be a (crude) proxy for the strength of a particular investor (or investors' group). The main problem with such a measure is that it ignores the stakes controlled by other shareholders. I acknowledge this problem, but – in order to enable comparability of my results with those in the existing literature – I apply this approach as well along with Banzhaf indices.[32]

4.5.3. Probit and tobit regression techniques

Following an extensive descriptive examination of payout behavior in the sample firms, I conduct a three-stage multivariate analysis of the relationship between payout patterns, ownership structures, and other firm characteristics. First, I explain the likelihood that a firm pays out some funds to shareholders (irrespectively of the payout channel chosen). In order to do so, I estimate random-effect panel regressions, where the dependent variable for an observation equals 1 if a firm paid a dividend and/or repurchased its shares in a particular year and 0 otherwise.[33] As the regressors, I employ various firm characteristics (firm size, profitability, investment opportunities, leverage) as well as ownership variables defined above. I also control for industry-specific and year-specific effects.

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[32] The summary statistics for the Banzhaf indices are reported in Table 5.3 in Chapter 5.

[33] An alternative estimation method is the fixed-effect logit model. However, this method restricts the parameters to be defined through the within-group dimension of the data. The estimates depend only on the values of explanatory variables within the subsample of firms that were changing their payout policies during the sample period (i.e. had years with positive as well as zero payout). This criterion effectively excludes a large fraction of the original sample (more than three quarters) from the estimation procedure. For instance, 71.00% of the firms distribute funds in any observed year, while 6.97% neither pays dividends nor repurchases shares over the whole sample period.

In the second stage, I model the likelihood that a firm opts for a particular earnings distribution channel. I employ random-effect panel data probit models with the same set of regressors as in the first stage. The advantage of this approach is that I am able to examine separately the determinants of dividend and repurchase decisions in the full sample. However, such an analysis provides only indirect evidence on the factors affecting the choice between these two payout mechanisms, since it does not take into account a potential relationship between dividend and repurchase decisions. My third type of models explicitly addresses this issue. I estimate double-censored random-effect tobit models, where the ratio of dividends to the total amount paid (i.e. the sum of dividends and share repurchases) plays the role of the dependent variable.

Many payout theories predict that a particular payout policy may attract a specific shareholder clientele. Therefore, the ownership variables in my models explaining payout decisions could be endogenous. In order to eliminate a potential simultaneity bias, I employ lagged ownership variables.

4.6. Results

4.6.1. The propensity to pay in the UK

In this section, I exhibit the general patterns and trends in dividend payments and share repurchases pursued by UK firms. The overwhelming majority of UK firms (85%) does pay dividends over the 1990s (see Table 4.4). Moreover, the proportion of dividend payers in the UK does not decrease over 1992-1998 (if anything, a modestly increasing trend can be observed). In any of the sample years, approximately five out of every six firms pay cash dividends. This result contrasts with the existing US evidence for the same period: only less than 24% of the American firms paid dividends (Fama and French, 2001).

Relatively few UK firms carry out an active buyback policy, which is consistent with the tax explanation of the payout channel choice, as in most of the sample years, the largest class of shareholders (i.e. tax-exempt investors) prefer dividends to any form of repurchases

Table 4.4. Propensity to pay – proportion of payers.

Year	Dividends	Share repurchases	Share repurchases or dividends
1992	83.57 %	4.68 %	83.94 %
1993	81.53 %	4.68 %	82.37 %
1994	84.13 %	4.54 %	84.47 %
1995	85.52 %	4.09 %	85.75 %
1996	85.06 %	6.36 %	85.81 %
1997	86.32 %	9.12 %	86.74 %
1998	93.02 %	11.16 %	93.02 %
Total	84.77 %	5.86 %	85.24 %

Note to Table 4.4: The numbers show which proportion of the sample firms pursued a particular payout policy in a given year. The last row presents the statistics for the pooled sample (5514 observations).

(Rau and Vermaelen, 2002). Companies appear to cater to these shareholders and to distribute funds using the dividend channel. On average slightly less than 6% of the analyzed firms repurchase shares. Again, this number can be contrasted with the corresponding US figure for the same period: Grullon and Michaely (2002) report that over the 1990s, the proportion of repurchasing US firms increases from about 70% to over 90%. Table 4.4 illustrates that the number of UK repurchasing firms tends to increase towards the end of the sample period. Since the preference of tax-exempt investors for dividends (as compared with share repurchases) weakens over the 1990s (see Section 4.3),[34] this increase is not surprising. Finally, approximately 85% of firms disburse funds to shareholders either as dividends or repurchases.[35]

Table 4.5 presents the average amounts spent on dividends, share repurchases, and total payout to shareholders by firms pursuing a particular form of payout. Apparently, not only are repurchase plans less popular than dividends, they are also smaller as far as the

[34] Tax-driven preferences of other types of shareholders remain unchanged over the sample period.

[35] Notably, the proportion of payers remains substantial even if I control for seasoned equity issues (results not reported in Table 4.4). For 73% of observations, the value of total payout exceeds the value of new on the equity issues. The corresponding number rises from 67% in 1993 to 83% in 1998, which again suggests an increasing (rather than decreasing) propensity to pay.

Table 4.5. Propensity to pay – amounts paid.

Year	Amount spent on dividends by dividend-paying firms (in £ thousands)		Amount spent on share repurchases by repurchasing firms (in £ thousands)		Average amount paid out by firms reimbursing the funds (in £ thousands)	
	Mean	Median	Mean	Median	Mean	Median
1992	10348	1232	10342	615	10892	1266
1993	9234	1111	13923	968	9930	1194
1994	9644	1201	13677	1154	10353	1287
1995	10553	1463	5866	393	10846	1500
1996	11543	1535	8623	817	12257	1609
1997	10569	1733	31514	976	13905	1854
1998	7383	1891	10290	636	8550	1933
Total	10218	1449	15989	799	11318	1502

Note to Table 4.5: All the values are expressed in constant 1992 prices. The last row presents the statistics for the pooled sample.

amounts transferred to shareholders are concerned. The median amount spent yearly by the repurchasing firms on buying back their shares equals approximately £ 0.8 million, which is much lower than the median dividend (£ 1.4 million) distributed by dividend-paying firms. This result is at odds with the implications of the adverse selection models that predict that larger distributions should be made via the repurchase channel (Brennan and Thakor, 1990; Lucas and McDonald, 1998). However, while in the respective subsamples, *median* dividend is larger than *median* value of the repurchased equity in every single sample year, there are no substantial differences in *average* sizes of dividends (among dividend-paying firms) and repurchases (among repurchasing firms).[36] Chapter 5 complements the results of this section and discusses the evolution of payout ratios maintained by the UK companies in the 1990s (see Section 5.4.1). Interestingly, Panel A of Table 5.5 shows that in every single year share repurchases constitute a larger fraction of market capitalization of repurchasing firms than the

[36] In 1997 the average repurchase was approximately three times larger than the average dividend. Relatively few larger-scale buy-back plans seem to account for most of the funds distributed to shareholders by means of repurchasing the equity. The two largest buybacks in the sample (made by EMI Group and Gallaher Group), both exceeding £ 400 million, were observed in 1997.

Table 4.6. Relative frequency of different payout methods: dividends vs. stock repurchases.

	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**Total**
$\frac{\text{Dividends}}{\text{Total payout}}$	94.71%	92.04%	92.91%	97.42%	94.79%	76.17%	85.56%	90.07%
$\frac{\text{No. of repurchasing firms}}{\text{No. of dividend paying firms}}$	5.60%	5.74%	5.40%	4.78%	7.48%	10.57%	12.00%	6.91%

Note to Table 4.6: The numbers in the first row of the table are the ratios of the aggregate data for the sample firms. Dividends and total payout are expressed in £ thousands (in constant 1992 prices). The last column presents the statistics for the pooled sample.

dividends do for dividend-paying firms. The same holds for payout ratios based on sales for 5 out of 7 sample years.[37]

The first row of Table 4.6 indicates that in five out of seven years analyzed, dividends constituted more than 92% of the aggregate payout to shareholders. In the last two years, this quantity was lower, but even in 1997, the ratio of the aggregate amount of dividends to the aggregate amount spent on share repurchases still exceeded 3:1. This confirms the relatively minor role of share repurchase plans in the UK.

The second row of Table 4.6 illustrates relative frequency of repurchases (as opposed to dividends) from a different perspective. In the first half of the 1990s, the number of firms that repurchased equity remained fairly stable and equaled approximately 5% of the number of the dividend-paying firms. In the second half of the 1990s, a steady upward trend in a relative popularity of repurchases can be observed. Still, even in the last sample year, the number of dividend-paying firms is more than eight times larger than the number of firms that repurchase their shares. Although buybacks become increasingly popular, the evidence of substitution of dividends by share buybacks in the analyzed period is still quite weak.

Table 4.7 investigates the relation between the likelihood of dividend payments and share repurchases. If these two channels are (possibly imperfect) substitutes

[37] Thus, in relative terms, the repurchases appear to be more important for repurchasing firms than the dividends are for the dividend-paying firms. Still, the median amount paid via the repurchase channel is smaller than the median size of a dividend (see Table 4.5).

Table 4.7. Proportion of repurchasing companies among dividend-paying and non-dividend-paying firms.

Year	Dividend-paying firms	Non-dividend-paying firms	t-tests for significance of the differences
1992	5.14 %	2.31 %	1.40
1993	4.71 %	4.55 %	0.09
1994	4.99 %	2.14 %	1.48
1995	4.52 %	1.53 %	1.60
1996	6.60 %	4.96 %	0.73
1997	10.07 %	3.10 %	2.56 *
1998	12.00 %	0.00 %	1.42
Total	6.35 %	3.10 %	3.71 **

Note to Table 4.7: * and ** denote significance at 5- and 1-% confidence level in two-tailed tests, respectively. The last row presents the statistics for the pooled sample (5514 observations).

(Jagannathan et al., 2000; Grullon and Michaely, 2002), the probabilities of their usage should be negatively related. Consequently, the proportion of repurchasing firms among dividend-payers should be lower than among firms that do not pay dividends. My results indicate the opposite. In every single year, repurchasing firms are more prevalent among dividend-paying firms (the differences are statistically insignificant in most years, however). In the pooled sample, 6.35% of dividend-paying companies and 3.10% of non-paying firms repurchase shares (the difference is significant at 1% level).[38]

4.6.2. The dynamics of payout

Table 4.8 examines the dynamics of dividends.[39] Panel A indicates that the median dividend-paying firm increases the amount of dividends by almost 11% a year. Panel B shows that in every single year between 1993 and 1998, more than a half of the sample companies increase their dividends. During the average sample year, 4% of the population of companies

[38] Fama and French (2001) report a similar finding for the US: the proportion of repurchasing firms among dividend-payers is higher than among firms that do not pay dividends.

[39] Chapter 5 provides a more detailed analysis of the relationship between payout dynamics and earnings.

Table 4.8. Year-to-year changes in dividend policy.

Panel A: Dividend changes – descriptive statistics

Year	Mean	Median
1993	30.91%	4.81%
1994	50.11%	11.14%
1995	43.88%	13.66%
1996	101.58%	12.16%
1997	33.84%	11.21%
1998	29.42%	10.31%
Total	51.47%	10.84%

Panel B: Dividend changes - frequencies

Year	1993	1994	1995	1996	1997	1998	Total
All cuts (excl. omissions)	23.33%	11.52%	10.08%	10.09%	13.18%	12.55%	13.38%
Large cuts (excl. omissions)	15.13%	6.18%	3.67%	4.66%	5.25%	5.44%	6.70%
Omissions	4.10%	2.55%	2.06%	2.11%	2.36%	3.35%	2.64%
No change (excl. contd. non-paying)	2.44%	3.03%	1.49%	1.88%	1.93%	2.93%	2.17%
Continued non-paying	13.21%	12.48%	11.45%	11.53%	11.15%	7.11%	11.67%
All increases (excl. initiations)	50.13%	58.55%	66.21%	68.40%	63.67%	68.20%	62.08%
Large increases (excl. initiations)	13.59%	23.52%	29.55%	25.17%	22.40%	24.27%	23.11%
Initiations and resumptions	3.46%	5.94%	4.35%	2.99%	3.86%	2.93%	4.04%

Note to Table 4.8: In Panel A, descriptive statistics are computed for firms with non-zero dividend in the preceding year. The last row in Panel A presents the statistics for the pooled sample (3843 observations). In Panel B, large cuts denote cuts exceeding 25% of the value in the preceding year. Similarly large increases mean increases exceeding 25% of the previous year value. The last column in Panel B presents the statistics for the pooled sample (4552 observations).

initiate or resume the dividends.[40] Only every seventh company cuts dividends (every sixth if omissions are classified in the same category).[41] Relatively few firms kept their aggregate dividends at a constant positive level. Almost one eight of the sample firms continue not to pay dividends over two consecutive years, but this group seems to shrink towards the end of the sample.

[40] This translates into a considerable number of migrations from the group of non-payers. Recall that in every sample year dividend-payers constitute more than 81% of the population.

[41] The corresponding numbers are slightly higher for the year 1993, when more than a quarter of sample companies cut or omitted dividend payments.

Notably, large cuts (i.e. larger than 25% of last-year dividend) constitute from 36% (in 1995) to 65% (in 1993) of all the dividend cuts, while large increases amount to 27-45% of dividend increases (depending on the year). This result suggests that despite the general trend toincrease the dividends, firms are cautious in doing so.[42] Companies are also reluctant to cut the dividends (Kalay, 1980), and, if they have to do so, they seem to pursue considerable cuts at once rather than to decrease payments over longer period.

Table 4.9 shows similar results for the total payout. The median company increases its payout by 11% a year. In an average sample year, approximately two thirds of the analyzed companies increase their payout, while only one sixth of the firms cuts or omits its distribution of earnings. The asymmetry between large increases and large cuts in total payment appears even more acute than of the dividend distribution: three quarters of the payout cuts versus only one third of the payout increases can be considered substantial payout changes (of 25% or more).

4.6.3. Firm characteristics, ownership structure, and the choice of the payout policy

So far, I have documented that vast majority of the companies reimburse funds to shareholders either via dividends or by repurchasing shares. Below, I investigate (i) which firms are more likely to pay dividends and/or reimburse the funds and (ii) what determines the choice of payout channel.

Table 4.10 presents the models explaining the likelihood that a firm opts to pay out funds. Models 4.1-4.4 indicate that shareholders are more likely to receive some payout from firms that are larger, i.e. presumably more mature (cf. Grullon et al., 2002). In line with my expectations, I find that high leverage decreases the likelihood of payout. There are several explanations for this significant relation. First, in highly levered firms, debt holders may

[42] Still, large dividend increases are more frequent than, for instance, in Germany. While in my UK sample over 37.2% of dividend increases can be considered large ones, the corresponding number for Germany is just 25.0% (Goergen et al., 2004). The proportion of substantial cuts is comparable across the two countries: the corresponding numbers equal 50.1% for the pooled UK sample and 47.5% for Germany.

Table 4.9. Year-to-year changes in payout policy.

Panel A: Total payout changes – descriptive statistics

Year	Mean	Median
1993	43.52%	5.02%
1994	53.63%	10.85%
1995	39.36%	13.47%
1996	102.52%	12.31%
1997	40.50%	11.69%
1998	30.44%	12.96%
Total	55.12%	10.89%

Panel B: Total payout changes - frequencies

Year	1993	1994	1995	1996	1997	1998	Total
All cuts (excl. omissions)	23.94%	13.64%	11.95%	10.83%	13.72%	15.31%	14.63%
Large cuts (excl. omissions)	19.95%	10.84%	8.05%	7.59%	9.77%	9.09%	10.93%
Omissions	3.99%	2.80%	2.30%	2.23%	2.74%	1.91%	2.74%
No change (excl. contd. non-paying)	2.32%	2.92%	1.38%	1.90%	1.76%	2.39%	2.05%
Continued non-paying	12.36%	11.57%	11.03%	10.60%	10.10%	5.26%	10.82%
Increases (excl. initiations)	53.93%	63.34%	69.43%	70.87%	67.95%	71.77%	65.72%
Large increases (excl. initiations)	14.54%	23.63%	30.00%	26.12%	25.47%	26.79%	24.31%
Initiations and resumptions	3.47%	5.72%	3.91%	3.57%	3.73%	3.35%	4.04%

Note to Table 9: In Panel A, descriptive statistics are computed for firms with non-zero payout in the preceding year. The last row in Panel A presents the statistics for the pooled sample (3818 observations). In Panel B, large cuts denote cuts exceeding 25% of the value in the preceding year. Similarly large increases mean increases exceeding 25% of the previous year value. The last column in Panel B presents the statistics for the pooled sample (4484 observations).

perform a monitoring task such that there is not much need for a disciplining role of the payout policy (in the spirit of Easterbrook, 1984). Second, the payout constraints embedded in the debt covenants may become binding. Expectedly, there is a strong positive relationship between the firm's return on assets and the likelihood of payout, as the generation of a sufficient stream of earnings is a necessary condition to reimburse funds to shareholders. Finally, consistent with Fama and French (2001), I find that strong investment opportunities discourage firms from distributing funds to shareholders. Still, this effect falls short of statistical significance in any of the models reported in Table 4.10.

Table 4.10. Random-effect probit explaining the likelihood of total payout.

	Model 4.1		**Model 4.2**		**Model 4.3**		**Model 4.4**	
Voting power measure	None		% of votes		Banzhaf absolute index		Banzhaf relative index	
Variable	Estimate	z-stat.	Estimate	z-stat.	Estimate	z-stat.	Estimate	z-stat.
Intercept	-5.57	-7.73***	-6.10	-7.46***	-6.50	-9.15***	-5.81	-7.52***
Firm size	1.97	10.97***	2.07	10.11***	2.05	11.52***	2.02	11.31***
Profitability	0.95	4.49***	1.02	4.71***	1.00	4.84***	0.99	4.78***
Tobin's Q proxy	-0.04	-1.14	-0.04	-1.06	-0.03	-0.71	-0.03	-0.70
Leverage	-1.25	-6.03***	-1.15	-5.48***	-1.30	-6.49***	-1.26	-6.25***
Voting power of executive directors			1.48	3.71***	1.01	5.18***	1.12	5.17***
Voting power of financial institutions			-0.64	-1.78†	0.57	3.35***	0.63	3.43***
Voting power of industrial firms			-1.05	-1.58	0.33	1.56	0.40	1.73†
Voting power of non-exec. directors			0.51	0.63	0.48	1.55	0.63	1.78†
Voting power of outside individuals			-0.78	-0.97	0.46	1.67†	0.56	1.86†
Year dummies	Yes		Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes		Yes	
No. of observations	4635		4635		4635		4635	
No. of firms	972		972		972		972	
Wald test	$\chi^2(15) = 263.22^{***}$		$\chi^2(20) = 245.23^{***}$		$\chi^2(20) = 271.51^{***}$		$\chi^2(20) = 274.99^{***}$	
Log likelihood	-1085.45		-1075.05		-1071.21		-1070.73	
σ_α	2.043		2.106		2.049		2.028	
ρ	0.807		0.816		0.808		0.804	
LR test of $\rho = 0$	$\chi^2(1) = 548.47^{***}$		$\chi^2(1) = 527.71^{***}$		$\chi^2(1) = 506.49^{***}$		$\chi^2(1) = 507.23^{***}$	

Note to Table 4.10: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% level, respectively. The dependent variable equals 1 if a firm pays a dividend and/or repurchases its shares in a particular year and 0 otherwise. All the values are expressed in constant 1992 prices. Firm size is defined as a natural logarithm of the market value of the firm (expressed in £ thousands). Profitability is defined as return on assets (i.e. the ratio of EBIT to the average of total assets at the beginning and the end of the year). Tobin's Q proxy is defined as the market-to-book ratio. Leverage is defined as the ratio of total debt to the book value of the total assets and is measured at the end of the year. All the ownership variables are lagged by one year. The construction of the Banzhaf indices is explained in Section 4.5.2.

Ownership concentration appears to be an important determinant of the payout decision as well. Models 4.2-4.4 indicate that the likelihood that a firm distributes funds (either via dividends or share repurchases) increases with the voting power of executive directors. This result appears inconsistent with the agency theory of payout (Easterbrook, 1984; Jensen, 1986), predicting that in a firm where managers enjoy high degree of discretion, they may pursue wasteful 'empire-building' activities rather than distribute funds to the

shareholders. My findings suggest that, given that the directors' equity stakes constitute a large fraction of their personal wealth, they seem to prefer a positive payout allowing them to diversify their personal portfolio or helping them to meet personal liquidity needs. Other classes of block holders seem to have a preference for a non-zero payout as well. For instance, Models 4.3 and 4.4 suggest that the control power of financial institutions translates into a higher probability of earnings payout. This preference may stem from tax or asset-liability management considerations (see Section 4.4).

Tables 4.11 and 4.12 separately explain firms' decisions regarding dividend distribution and share repurchase. The results document a strong relationship between firm characteristics and the probability that a particular firm pays a dividend (see Models 4.5-4.8 in Table 4.11). Companies that are larger, more profitable, and less levered are significantly more likely to pay dividends. A firm with lesser investment opportunities is more likely to be a dividend-payer as well. These results are in line with those reported in Table 4.10 for the likelihood of the total payout. As reported in Table 4.12, firms' profitability positively affects the likelihood of share repurchases. Model 4.9 suggests also that larger firms are more likely to buy their shares back, but this effect falls short of statistical significance in Models 4.10-4.12. Leverage and investment opportunities do not appear to be significant determinants of the repurchase decision in Models 4.9-4.12.

Table 4.11 illustrates that powerful managers prefer positive dividend payout, which is consistent with the results reported earlier for the total payout variable. Interestingly, however, Models 4.7 and 4.8 indicate that a similar preference for dividends seems to be shared by other types of block holders (financial institutions, industrial firms, non-executive directors, and outside individuals) as well. This finding should be contrasted with block holders' dislike of share repurchase programs: a significantly negative relationship between the power of a particular block holder category and the likelihood of share repurchases holds almost uniformly for any of the five classes of shareholders considered. There are two

Table 4.11. Random-effect probit models explaining the likelihood of dividend payout.

	Model 4.5		**Model 4.6**		**Model 4.7**		**Model 4.8**	
Voting power measure	None		% of votes		Banzhaf absolute index		Banzhaf relative index	
Variable	Estimate	z-stat.	Estimate	z-stat.	Estimate	z-stat.	Estimate	z-stat.
Intercept	-5.17	-6.47***	5.59	-7.34***	-7.34	-9.65***	-7.31	-9.37***
Firm size	2.21	11.53***	2.26	13.26***	2.22	12.28***	2.19	11.89***
Profitability	0.91	4.40***	1.00	4.94***	1.15	4.38***	1.15	4.80***
Tobin's Q proxy	-0.12	-2.87**	-0.10	-2.43*	-0.08	-1.94†	-0.08	-1.91†
Leverage	-1.50	-7.36***	-1.63	-7.40***	-1.46	-6.42***	-1.42	-6.65***
Voting power of executive directors			1.85	4.69***	1.21	6.02***	1.33	5.91***
Voting power of financial institutions			-0.53	-1.55	0.78	4.59***	0.84	4.64***
Voting power of industrial firms			0.14	0.29	0.50	2.32*	0.58	2.52*
Voting power of non-exec. directors			0.93	1.19	0.72	2.29*	0.88	2.46*
Voting power of outside individuals			-1.05	-1.27	0.61	2.22*	0.71	2.38*
Year dummies	Yes		Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes		Yes	
No. of observations	4679		4679		4679		4679	
No. of firms	982		982		982		982	
Wald test	$\chi^2(15) = 281.85^{***}$		$\chi^2(20) = 281.38^{***}$		$\chi^2(20) = 294.34^{***}$		$\chi^2(20) = 293.44^{***}$	
Log likelihood	-1091.59		-1080.28		-1071.89		-1071.72	
σ_α	2.309		2.412		2.190		2.159	
ρ	0.842		0.853		0.828		0.823	
LR test of $\rho = 0$	$\chi^2(1) = 622.82^{***}$		$\chi^2(1) = 593.72^{***}$		$\chi^2(1) = 565.93^{***}$		$\chi^2(1) = 565.67^{***}$	

Note to Table 4.11: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% level, respectively. The dependent variable equals 1 if a firm pays a dividend in a particular year and 0 otherwise. All the values are expressed in constant 1992 prices. Firm size is defined as a natural logarithm of the market value of the firm (expressed in £ thousands). Profitability is defined as return on assets (i.e. the ratio of EBIT to the average of total assets at the beginning and the end of the year). Tobin's Q proxy is defined as the market-to-book ratio. Leverage is defined as the ratio of total debt to the book value of the total assets and is measured at the end of the year. All the ownership variables are lagged by one year. The construction of the Banzhaf indices is explained in Section 4.5.2.

possible explanations for this effect. First, due to the partial imputation feature of the UK tax system in the analyzed period, most shareholders are (weakly) better off if the payments are made by means of dividends rather than share repurchases. Second, the preference of dividends over share buybacks can also be attributed to the existence of stringent insider trading rules (see Section 4.4). This argument seems the most plausible for company directors, but is also likely to hold for large block holders, who may be subject to detailed

Table 4.12. Random-effect probit models explaining the likelihood of share repurchases.

	Model 4.9		**Model 4.10**		**Model 4.11**		**Model 4.12**	
Voting power measure	None		% of votes		Banzhaf absolute index		Banzhaf relative index	
Variable	Estimate	z-stat.	Estimate	z-stat.	Estimate	z-stat.	Estimate	z-stat.
Intercept	-2.92	-8.21***	-1.70	-4.16***	-1.63	-4.08***	-0.91	-2.16*
Firm size	0.19	2.96**	0.03	0.43	0.09	1.31	0.10	1.45
Profitability	0.46	2.02*	0.46	1.92†	0.42	1.77†	0.44	1.83†
Tobin's Q proxy	0.02	0.80	-0.01	-0.35	-0.02	-0.62	-0.01	-0.57
Leverage	-0.12	-0.81	-0.11	-0.69	-0.11	-0.66	-0.12	-0.72
Voting power of executive directors			-1.34	-4.08***	-1.02	-6.68***	-1.07	-6.72***
Voting power of financial institutions			-1.31	-4.56***	-0.84	-7.23***	-0.86	-7.23***
Voting power of industrial firms			-1.07	-2.54*	-0.83	-4.64***	-0.86	-4.69***
Voting power of non-exec. directors			-2.83	-2.73**	-1.91	-3.95***	-2.24	-3.89***
Voting power of outside individuals			-1.43	-1.89†	-0.70	-3.10**	-0.81	-3.35***
Year dummies	Yes		Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes		Yes	
No. of observations	4638		4638		4638		4638	
No. of firms	972		972		972		972	
Wald test	$\chi^2(15) = 56.63^{***}$		$\chi^2(20) = 83.92^{***}$		$\chi^2(20) = 110.71^{***}$		$\chi^2(20) = 109.86^{***}$	
Log likelihood	-980.05		-957.39		-940.43		-941.52	
σ_α	0.715		0.762		0.750		0.756	
ρ	0.338		0.368		0.360		0.364	
LR test of $\rho = 0$	$\chi^2(1) = 75.16^{***}$		$\chi^2(1) = 85.92^{***}$		$\chi^2(1) = 82.75^{***}$		$\chi^2(1) = 84.82^{***}$	

Note to Table 4.12: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% level, respectively. The dependent variable equals 1 if a firm repurchases its shares in a particular year and 0 otherwise. All the values are expressed in constant 1992 prices. Firm size is defined as a natural logarithm of the market value of the firm (expressed in £ thousands). Profitability is defined as return on assets (i.e. the ratio of EBIT to the average of total assets at the beginning and the end of the year). Tobin's Q proxy is defined as the market-to-book ratio. Leverage is defined as the ratio of total debt to the book value of the total assets and is measured at the end of the year. All the ownership variables are lagged by one year. The construction of the Banzhaf indices is explained in Section 4.5.2.

transaction disclosure requirements and whose actions are likely to be followed by the financial press, analysts, and investors (Fidrmuc et al., 2004). Therefore, directors (or other block holders) may prefer obtaining a dividend payment to having to liquidate a part of their stake in a company (which would be the case, if they were to obtain the funds via a share repurchase plan). A partial liquidation of the stake by a director (or a leading shareholder)

Table 4.13. Double-censored random-effect tobit models explaining relative popularity of two payout methods.

	Model 4.13		**Model 4.14**		**Model 4.15**		**Model 4.16**	
Voting power measure	None		% of votes		Banzhaf absolute index		Banzhaf relative index	
Variable	Estimate	z-stat.	Estimate	z-stat.	Estimate	z-stat.	Estimate	z-stat.
Intercept	3.58	11.90***	2.58	8.26***	2.39	8.10***	2.43	8.22***
Firm size	-0.15	-3.13**	-0.03	-0.59	-0.06	-1.37	-0.07	-1.53
Profitability	-0.33	-1.75†	-0.31	-1.65†	-0.26	-1.42	-0.27	-1.49
Tobin's Q proxy	-0.02	-1.10	0.00	0.14	0.01	0.48	0.01	0.43
Leverage	0.05	0.42	0.03	0.24	0.02	0.20	0.03	0.26
Voting power of executive directors			0.86	3.77***	0.77	6.68***	0.80	6.68***
Voting power of financial institutions			0.99	4.41***	0.67	7.18***	0.68	7.14***
Voting power of industrial firms			0.74	2.31*	0.67	4.73***	0.68	4.73***
Voting power of non-exec. directors			2.34	2.85**	1.61	4.03***	1.90	3.90***
Voting power of outside individuals			1.06	1.78†	0.56	3.18***	0.63	3.38***
Year dummies	Yes		Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes		Yes	
No. of observations	4688		4688		4688		4688	
No. of firms	982		982		982		982	
Wald test	$\chi^2(15) = 43.69^{***}$		$\chi^2(20) = 70.48^{***}$		$\chi^2(20) = 95.66^{***}$		$\chi^2(20) = 94.73^{***}$	
Log likelihood	-1103.27		-1082.77		-1062.83		-1064.63	
σ_α	0.041		0.042		0.041		0.041	
σ_e	1.115		1.083		1.057		1.057	
ρ	0.001		0.002		0.001		0.001	

Note to Table 4.13: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% level, respectively. The dependent variable is the ratio of the value of dividend to the total payout made by the company in a particular year. All the values are expressed in constant 1992 prices. Firm size is defined as a natural logarithm of the market value of the firm (expressed in £ thousands). Profitability is defined as return on assets (i.e. the ratio of EBIT to the average of total assets at the beginning and the end of the year). Tobin's Q proxy is defined as the market-to-book ratio. Leverage is defined as the ratio of total debt to the book value of the total assets and is measured at the end of the year. All the ownership variables are lagged by one year. The construction of the Banzhaf indices is explained in Section 4.5.2.

may negatively affect the price of the stock, and, consequently, reduce the value of the remaining equity holdings of such a shareholder.

Table 4.13 analyzes the choice of the mode of payment from a different point of view. Instead of investigating the determinants of the likelihood of dividend payments and share

repurchases separately, the tobit regressions here explicitly model the relative preference with respect to those two distribution channels. Model 4.13 shows that big firms tend to distribute relatively larger fraction of the total payout via a repurchase channel than small firms do. The corresponding coefficients are not significant in the remaining specifications reported in Table 4.13. There seems to be also some weak evidence of the preference of more profitable firms for the repurchases channel (see Models 4.13-4.14). Models 4.14-4.16 fully corroborate earlier findings on block holders' relative preference for dividends (as opposed to share buybacks).

4.7. Additional analyses and robustness checks

4.7.1. One-stage voting game

As indicated earlier, some payout theories imply that, depending on their identity, large shareholders differ as far as their preferences with respect to the payout policy is concerned. Still, in the sample period block holders appear to behave similarly (irrespectively of the category of shareholder). Thus, I examine whether it is a coalition of block holders (with similar preferences) or merely the largest block holder who influence the choice of the payout channel. To investigate this issue, I consider a one-stage oceanic voting game, where each shareholder is treated as a separate player, and compute the corresponding Banzhaf indices to measure block holders' voting power. I employ those measures and re-estimate probit and tobit models discussed in the previous section.[43] This approach stipulates that rather than forming type-based coalitions first, and participating in the voting game only afterwards, block holders attempt to achieve their payout policy goals on their own.

[43] In all the models reported in Tables 4.14-4.17, I employ as regressors the measures of voting power for the two largest block holders. I estimated the models where I considered also the voting power of the third largest shareholder (a typical company has three blocks exceeding 5% of the equity outstanding), but the corresponding coefficient proves insignificant in most specifications.

Table 4.14. Random-effect probit explaining the likelihood of total payout for one-stage voting games.

	Model 4.17		**Model 4.18**		**Model 4.19**	
Voting power measure	% of votes		Banzhaf absolute index		Banzhaf relative index	
Variable	**Estimate**	**z-statistic**	**Estimate**	**z-statistic**	**Estimate**	**z-statistic**
Intercept	-5.74	-7.58***	-6.22	-8.42***	-6.22	-8.42***
Firm size	1.98	10.92***	1.99	11.02***	1.98	11.01***
Profitability	0.95	4.52***	1.00	4.90***	1.00	4.88***
Tobin's Q proxy	-0.04	-1.06	-0.03	-0.80	-0.03	-0.79
Leverage	-1.25	-6.01***	-1.28	-6.42***	-1.28	-6.39***
Voting power of the largest block holder	0.07	0.16	0.61	3.53***	0.67	3.82***
Voting power of the 2nd largest block holder	0.90	0.92	0.68	2.34*	1.38	2.89**
Year dummies	Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes	
No. of observations	4636		4636		4636	
No. of firms	972		972		972	
Wald test	$\chi^2(17) = 268.49^{***}$		$\chi^2(17) = 271.04^{***}$		$\chi^2(17) = 271.05^{***}$	
Log likelihood	-1085.09		-1078.93		-1077.86	
σ_α	2.039		2.040		2.047	
ρ	0.806		0.806		0.807	
LR test of $\rho = 0$	$\chi^2(1) = 542.22^{***}$		$\chi^2(1) = 531.84^{***}$		$\chi^2(1) = 538.51^{***}$	

Note to Table 4.14: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% level, respectively. The dependent variable equals 1 if a firm pays a dividend and/or repurchases its shares in a particular year and 0 otherwise. All the values are expressed in constant 1992 prices. Firm size is defined as a natural logarithm of the market value of the firm (expressed in £ thousands). Profitability is defined as return on assets (i.e. the ratio of EBIT to the average of total assets at the beginning and the end of the year). Tobin's Q proxy is defined as the market-to-book ratio. Leverage is defined as the ratio of total debt to the book value of the total assets and is measured at the end of the year. All the ownership variables are lagged by one year. The construction of the Banzhaf indices is explained in Section 4.5.2.

Tables 4.14-4.17 summarize the findings for one-stage voting games. The results reported in Table 4.14 show a pattern similar to those obtained earlier for block holder coalitions. The presence of powerful block holders translates into higher likelihood of corporate payout (see Models 4.18 and 4.19).[44] Coefficients for the other determinants of the

[44] The corresponding coefficients in Model 4.17 have the same positive signs, but they fall short of statistical significance.

Table 4.15. Random-effect probit models explaining the likelihood of dividend payout for one-stage voting games.

	Model 4.20		**Model 4.21**		**Model 4.22**	
Voting power measure	% of votes		Banzhaf absolute index		Banzhaf relative index	
Variable	**Estimate**	**z-statistic**	**Estimate**	**z-statistic**	**Estimate**	**z-statistic**
Intercept	-6.58	-8.13***	-7.27	-8.37***	-7.22	-8.23***
Firm size	2.23	11.67***	2.22	10.95***	2.19	10.94***
Profitability	0.92	4.42***	1.16	4.91***	1.17	4.88***
Tobin's Q proxy	-0.11	-2.74**	-0.08	-1.98*	-0.08	-2.02*
Leverage	-1.48	-7.38***	-1.39	-6.51***	-1.38	-6.37***
Voting power of the largest block holder	0.28	0.73	0.78	4.46***	0.82	4.69***
Voting power of the 2nd largest block holder	1.67	1.68†	1.05	3.53***	2.01	4.18***
Year dummies	Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes	
No. of observations	4680		4680		4680	
No. of firms	982		982		982	
Wald test	$\chi^2(17) = 293.59^{***}$		$\chi^2(17) = 281.62^{***}$		$\chi^2(17) =$ ***	
Log likelihood	-1089.69		-1080.69		-1079.48	
σ_α	2.292		2.236		2.221	
ρ	0.840		0.833		0.831	
LR test of $\rho = 0$	$\chi^2(1) = 614.56^{***}$		$\chi^2(1) = 596.62^{***}$		$\chi^2(1) = 605.13^{***}$	

Note to Table 4.15: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% level, respectively. The dependent variable equals 1 if a firm pays a dividend in a particular year and 0 otherwise. All the values are expressed in constant 1992 prices. Firm size is defined as a natural logarithm of the market value of the firm (expressed in £ thousands). Profitability is defined as return on assets (i.e. the ratio of EBIT to the average of total assets at the beginning and the end of the year). Tobin's Q proxy is defined as the market-to-book ratio. Leverage is defined as the ratio of total debt to the book value of the total assets and is measured at the end of the year. All the ownership variables are lagged by one year. The construction of the Banzhaf indices is explained in Section 4.5.2.

likelihood of payout have the same signs as those in models from Table 4.10 and remain highly significant: firms that are larger, more profitable, and less levered tend to be more likely to distribute funds to shareholders via dividends or share repurchases.

Tables 4.15 and 4.16 report the estimates of models explaining separately the likelihood of dividend payments and share repurchases, respectively. Again the results are in line with those obtained earlier for block holder coalitions. *Ceteris paribus*, concentrated

Table 4.16. Random-effect probit models explaining the likelihood of share repurchases for one-stage voting games.

	Model 4.23		**Model 4.24**		**Model 4.25**	
Voting power measure	% of votes		Banzhaf absolute index		Banzhaf relative index	
Variable	**Estimate**	**z-statistic**	**Estimate**	**z-statistic**	**Estimate**	**z-statistic**
Intercept	-1.81	-4.54***	-1.78	-4.61***	-1.93	-5.05***
Firm size	0.05	0.73	0.11	1.68†	0.13	1.96†
Profitability	0.44	1.86†	0.40	1.68†	0.39	1.68†
Tobin's Q proxy	0.00	-0.20	-0.01	-0.49	-0.01	-0.30
Leverage	-0.10	-0.63	-0.09	-0.57	-0.09	-0.57
Voting power of the largest block holder	-0.88	-2.79**	-0.78	-6.78***	-0.74	-6.42***
Voting power of the 2nd largest block holder	-3.69	-4.65***	-1.43	-6.07***	-2.52	-6.55***
Year dummies	Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes	
No. of observations	4639		4639		4639	
No. of firms	972		972		972	
Wald test	$\chi^2(17) = 83.00^{***}$		$\chi^2(17) = 105.96^{***}$		$\chi^2(17) = 102.15^{***}$	
Log likelihood	-959.09		-947.34		-950.30	
σ_α	0.755		0.741		0.735	
ρ	0.363		0.355		0.351	
LR test of $\rho = 0$	$\chi^2(1) = 84.28^{***}$		$\chi^2(1) = 81.26^{***}$		$\chi^2(1) = 80.02^{***}$	

Note to Table 4.16: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% level, respectively. The dependent variable equals 1 if a firm repurchases its shares in a particular year and 0 otherwise. All the values are expressed in constant 1992 prices. Firm size is defined as a natural logarithm of the market value of the firm (expressed in £ thousands). Profitability is defined as return on assets (i.e. the ratio of EBIT to the average of total assets at the beginning and the end of the year). Tobin's Q proxy is defined as the market-to-book ratio. Leverage is defined as the ratio of total debt to the book value of the total assets and is measured at the end of the year. All the ownership variables are lagged by one year. The construction of the Banzhaf indices is explained in Section 4.5.2.

ownership increases the likelihood of dividend payments and decreases the probability of share repurchases. Table 4.17 provides further evidence on block holders' preference for dividends (vs. share buyback programs). These results strengthen the validity of the insider trading explanation for the observed pattern (see Section 4.6.3). Moreover, they are inconsistent with the implications of the model Brennan and Thakor (1990), which predicts that repurchases are more likely in firms with concentrated ownership.

Table 4.17. Double-censored random-effect tobit models explaining relative popularity of two payout methods for one-stage voting game.

	Model 4.26		**Model 4.27**		**Model 4.28**	
Voting power measure	% of votes		Banzhaf absolute index		Banzhaf relative index	
Variable	**Estimate**	**z-statistic**	**Estimate**	**z-statistic**	**Estimate**	**z-statistic**
Intercept	2.64	8.57***	2.49	8.60***	2.60	8.98***
Firm size	-0.04	-0.78	-0.08	-1.68†	-0.09	-1.93†
Profitability	-0.30	-1.59	-0.25	-1.35	-0.25	-1.36
Tobin's Q proxy	0.00	-0.02	0.01	0.39	0.00	0.20
Leverage	0.02	0.20	0.01	0.11	0.01	0.09
Voting power of the largest block holder	0.49	2.18*	0.62	6.63***	0.59	6.33***
Voting power of the 2nd largest block holder	3.01	4.72***	1.21	6.30***	2.18	6.78***
Year dummies	Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes	
No. of observations	4688		4688		4688	
No. of firms	982		982		982	
Wald test	$\chi^2(17) = 68.63^{***}$		$\chi^2(17) = 92.61^{***}$		$\chi^2(17) = 88.99^{***}$	
Log likelihood	-1084.48		-1068.83		-1071.36	
σ_α	0.042		0.040		0.040	
σ_e	1.087		1.062		1.065	
ρ	0.001		0.001		0.001	

Note to Table 4.17: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% level, respectively. The dependent variable is the ratio of the value of dividend to the total payout made by the company in a particular year. All the values are expressed in constant 1992 prices. Firm size is defined as a natural logarithm of the market value of the firm (expressed in £ thousands). Profitability is defined as return on assets (i.e. the ratio of EBIT to the average of total assets at the beginning and the end of the year). Tobin's Q proxy is defined as the market-to-book ratio. Leverage is defined as the ratio of total debt to the book value of the total assets and is measured at the end of the year. All the ownership variables are lagged by one year. The construction of the Banzhaf indices is explained in Section 4.5.2.

All in all, two major conclusions stem from the analysis of one-stage voting games. First, the relative voting power of large shareholders matters for firms' payout choices. Second, it is not just the most powerful shareholder who tries to impose a specific payout policy. In a typical company, it is a coalition of at least two leading shareholders that influences the choice of the payout channel.

4.7.2. Robustness checks

I also performed a number of additional analyses to assure the robustness of my results.[45] First, I tested for the impact of the 1997 change of the tax code, which has affected the way dividends are taxed and, consequently, may have altered investors' preferences for dividends vis-à-vis share repurchases. In order to investigate the effect of this structural change, I allowed the coefficients corresponding to the ownership variables to differ in the periods before and after the change (i.e. until 1996 and as of 1997, respectively). The results are in line with predictions of tax-based clientele theories: following the change, financial institutions' preference for dividends (as opposed to share repurchases) have become less pronounced. However, this effect is not statistically significant at usual confidence levels. Other conclusions of the models reported in Section 4.6.3 remain unchallenged.

Second, I controlled for the possibility that new equity issues may affect the choice of firm's payout policy in a particular year (e.g. firms that have just raised new equity capital can hardly be expected to repurchase their shares immediately after a seasoned equity offering). I extended model specifications reported in Tables 4.10-4.17 and include as a regressor a dummy variable that equals one, when a firm issued new equity in a particular year, and zero otherwise. This new variable is not significant in any specification, while the earlier conclusions are upheld.

Third, some of the signaling theories of payout (see Sections 4.2.1 and 4.2.2) stipulate that dividends and/or share repurchases should be perceived signals of firms' quality. The aim of such a signal could be to help companies to raise new equity capital in the period following the payout. Consequently, it can be expected that firms that pay dividends and/or repurchase the shares are more likely to issue new equity in a subsequent year.[46] I verified such a supposition and estimated the models explaining the likelihood of new equity issues as a

[45] The results of the models discussed in this section are not reported. All the estimates are available upon request.

[46] The agency model proposed by Easterbrook (1984) also relates new equity issues and payout: the firms that pay out funds are forced to raise capital externally.

function of past payout behavior and a set of control variables (firm size, profitability, leverage, investment opportunities, industry, and year effects). The results do not confirm such a signaling theory: payout (in particular, in the form of share repurchases) decreases rather than increases the likelihood of a new equity issue.

Fourth, it may be the case that the Tobin's Q proxy employed in the earlier analyses does not capture the growth potential of the analyzed firms well. Moreover, Baker and Wurgler (2004a, 2004b) argue that the difference in Tobin's Q between dividend payers and non-payers can be interpreted as the premium the investors are ready to pay for the firms' catering to investors' preferences. Consequently, the catering theory of dividends would render the Tobin's Q proxy endogenous. In order to mitigate both problems, I re-estimated my probit and tobit models with the rate of asset growth replacing the Tobin's Q proxy. The results are virtually identical to those reported in Sections 4.6.3 and 4.7.1.

I attempted to address the (potential) endogeneity issue in yet another way. Rather than employing the Tobin's Q proxy from the year, in which the analyzed dividend decision is taken, I employ a value lagged one year instead. Again, the results are in line with those reported in Sections 4.6.3 and 4.7.1. Notably, my analyses provide some additional evidence against the catering theory of dividends (Baker and Wurgler, 2004a and 2004b). It is puzzling why so many companies actually do pay dividends (see Table 4.4), since the proxy for the stock market dividend premium (i.e. difference in Tobin's Q between dividend payers and non-payers) is negative in most of the sample years.

Finally, all the results are robust to different definitions of firm size (log of market capitalization and log of total assets) and of leverage (expressed in book value and market value).

4.8. Conclusions

I use a large panel of UK companies over the 1990s to study two key aspects of firms' payout policies: the decision whether to distribute funds at all and the choice of the payout

channel (i.e. dividends, repurchases, or both). The analysis of time-series and cross-sectional patterns in payout behavior reveals several interesting results. In the 1990s, almost 85% of the UK companies pay dividends and the payout policy remains relatively stable. Contrary to the recent evidence for the US, I find that in the UK firms do not demonstrate decreasing propensity to distribute funds to shareholders. I acknowledge that this discrepancy could be partly attributed to the differences in tax systems between the two countries. Still, the existence of tax clienteles cannot fully explain all the documented patterns. Moreover, I show that the companies distributing funds to shareholders are usually larger, more profitable, and less levered, they grow more slowly, and have fewer investment opportunities than their counterparts who do not distribute (excess) funds to shareholders.

Whereas the importance of share repurchases is increasing, dividends still constitute a vast fraction of the total payout. Moreover, repurchasing firms usually pay dividends as well. Therefore, I find only weak support for the claim that UK firms substitute dividends with share repurchases (as their US peers do). My results document also a very strong relationship between the presence of block holders and the choice of the payout channel: firms with concentrated ownership tend to opt for dividends rather than share repurchases. This effect is robust to the way in which the voting power of the block holders is measured and holds irrespectively of the identity of the controlling shareholder (financial institution, directors, other individuals, industrial firms). I argue that the presence of stringent insider trading regulation may affect the attractiveness of repurchases (as opposed to dividends) for large shareholders. Developing a theoretical model that would formalize the insider-trading explanation for the observed relationship between ownership concentration and the choice of the payout channel seems an attractive area for the future research.

Finally, Chapter 4 contributes to the ongoing debate on the method of measuring voting power. I advocate the use of Banzhaf indices as a relevant measure of voting power in the analysis of corporate policy choices. According to my best knowledge, together with

Chapter 5, it is the first study employing those game-theoretical concepts in the context of corporate payout decisions.

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Chapter 5

Control Structures and Payout Policy

5.1. Introduction

The opinions about the relative importance of different determinants of corporate payout vary across both scholars and financial mangers (Allen and Michaely, 2003; Brav et al., 2003; Baker and Wurgler, 2004). For instance, Correia da Silva et al. (2004) cite part of a letter written to the major UK companies by Michael McLintock, the CEO of M&G, part of Prudential and one of the largest institutional investors in the UK. In this letter McLintock argues that *'the investment case for dividends in the majority of circumstances is a strong and well-supported one, has stood the test of time, and is likely to be increasingly appreciated in the economic and stock market conditions which we seem likely to face for the foreseeable future.*'[1] This view does not appear to be uniformly shared by the investment community. Apparently, some investment bankers admit '*telling their clients that paying dividends is like an admission that you have nothing better to do.*'[2]

Although the seminal research in this area dates back to Lintner (1956), Miller and Modigliani (1961), and Black (1976), the controversy about why firms should pay dividends

[1] *The Financial Times.* October 8, 2002.

[2] *The Economist.* November 18, 1999.

has not been satisfactorily resolved.[3] This chapter contributes to this debate as it assesses empirically the contrasting predictions of agency theories of payout (Rozeff, 1982; Easterbrook, 1984; Jensen, 1986) and the implications of the pecking order models (Myers, 1984; Myers and Majluf, 1984). In particular, Chapter 5 derives and tests a set of hypotheses pertaining to the impact of shareholder control concentration on the firms' payout ratios.[4] I argue that the controlling shareholders trade off the agency problems of free cash flow against the risk of underinvestment, and try to enforce payout policies that optimally balance these two costs.

In addition, the role of share repurchase plans (as a way of disbursing funds to shareholders) has recently increased both in the US (Grullon and Michaely, 2002) and the UK (Oswald and Young, 2004). Therefore, contrary to the existing studies that have analyzed payout policies in the UK, I do not restrict my attention to one payout channel only (either dividends, or repurchases), and I investigate the factors that determine total payout.[5]

Chapter 5 complements the existing literature in several ways. First, I investigate the relationship between the dynamics of earnings payout and the voting power enjoyed by different types of shareholders. This allows me to test a set of hypotheses derived from agency and pecking order theories. Second, I address the problem of control measurement and advocate the use of Banzhaf indices as a relevant measure of voting power in the analysis of corporate policy choices. According to my best knowledge, this (together with Chapter 4) is the first study employing those game theory-based concepts in the context of corporate payout

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[3] The well-known textbook of Brealey and Myers (2003) deems the dividend controversy to be among the '10 unsolved problems in finance'.

[4] Recent theoretical and empirical studies relating ownership and payout include among others Eckbo and Verma (1994), Lucas and McDonald (1998), Allen et al. (2000), Fenn and Liang (2001), Grinstein and Michaely (2002), Short et al. (2002), Gugler and Yurtoglu (2003), Perez-Gonzalez (2003), Farinha (2003), Gugler (2003), Brav et al. (2003), and Baker and Wurgler (2004).

[5] For the UK, Bond et al. (1996), Lasfer (1996), Bell and Jenkinson (2002), Short et al. (2002), Farinha (2003), Lasfer and Zenonos (2003), Correia da Silva et al. (2004) analyze dividend policy only, while Rau and Vermaelen (2002) and Oswald and Young (2004) focus exclusively on factors determining repurchase decisions.

policies. Third, I extend the traditional framework proposed by Lintner (1956) and suggest an econometrically sound approach to modeling the dynamics of the total payout. Whereas most – even recent – studies on payout policy show some methodological flaws, I apply state-of-the-art dynamic panel data estimation procedures.

I analyze a large panel of UK firms for the 1990s and find that the payout policy is significantly related to control concentration. Expectedly, profitability is a crucial determinant of payout decisions, but the presence of strong block holders or block holder coalitions weakens the relationship between the corporate earnings and the payout dynamics. Block holders appear to realize that an overly generous payout may render the company to be liquidity constrained, and, consequently, result in suboptimal investment policy. While the impact of the voting power of shareholders' coalitions on payout ratios is found to be always negative, the magnitude of this effect differs across different categories of block holders (i.e. industrial firms, outside individuals, directors, financial institutions). The results challenge some of the implications of the agency theories of payout, and favor a pecking-order explanation for the observed patterns. My analysis of payout dynamics reveals also that companies adjust payout policies to changes in earnings only gradually, which is consistent with 'dividend smoothing' as documented in the literature. In fact, my results suggest a presence of a more general phenomenon of the 'total payout smoothing'.

The remainder of this chapter is organized as follows. Section 5.2 surveys the background literature, develops research hypotheses, and motivates the control variables used in the study. Subsequent part describes data and methodology used in the chapter. Results of the analyses are presented in Section 5.4. Section 5.5 discusses the extensions and robustness checks, while Section 5.6 concludes.

5.2. Payout policy and ownership structure

5.2.1. Background literature

Miller and Modigliani (1961) were the first to challenge the popular belief that higher payout translates into higher firm value. Under the restrictive conditions of perfect capital markets, any mix of retained earnings and payout will not affect firm value. Still, the evidence that payout policy is not irrelevant abounds as neither investors nor managers appear indifferent as far as the firms' payout choices are concerned (Allen and Michaely, 2003; Brav et al., 2003). The existing literature advances several theoretical justifications for firms' payout choices. Among those explanations, the agency theory plays a prominent role.[6]

This chapter takes such an agency perspective as a starting point for explaining payout policy. Thus, I focus on contract incompleteness and information asymmetries as the forces driving payout decisions. The agency models of dividends relax the original Miller and Modigliani (1961) assumption about the independence of dividend and investment policies of the firm. Whenever a firm suffers from agency conflicts between managers and shareholders, payout policy may provide a partial remedy (Rozeff, 1982). Distributing funds to shareholders by means of dividends or share repurchases forces firms to raise capital externally in order to finance new projects and, consequently, to be submitted to the discipline of the market (Easterbrook, 1984). A commitment to pay out funds to shareholders (either as dividends or as repurchases) reduces the amount of free cash flows that managers could otherwise spend on value reducing projects (Jensen, 1986).[7] However, the early agency models of payout do not distinguish between share repurchases and dividends. Additionally, the credibility of the

[6] Other explanations include, for instance, taxation, signaling arguments, institutional constraints, and behavioral considerations (Allen and Michaely, 2003). While I acknowledge that some of these factors may affect firms' payout choices, a full analysis of all those possible explanations is beyond the scope of this chapter. Bond et al. (1996), Lasfer (1996), Bell and Jenkinson (2002), Rau and Vermaelen (2002), Oswald and Young (2004), and Chapter 4 of this dissertation extensively discuss the empirical relevance of those arguments (in particular, taxation) in the UK context.

[7] High payout may alleviate agency problems emerging between managers and shareholders, but could induce agency problems between debt and equity holders (Jensen and Meckling, 1976; Myers, 1977). By enforcing excessive payout, equity holders might try to expropriate wealth from debt holders.

commitment to pay out funds can be questioned – it is relatively easy for management to renege on a dividend payout promises. Finally, early agency models are also criticized for assuming that managers can be forced to pay out funds, while they cannot be prevented from pursuing suboptimal investment policy (Allen and Michaely, 2003).

More recent theoretical studies address these problems. For instance, Fluck (1999) develops a model, in which the amount of dividends depends on the outsiders' effectiveness in disciplining the management. Allen et al. (2000) propose a model that relates agency arguments and tax-clientele theories, to a signaling explanation of dividends. In their model, firms pay high dividends in order to attract lower-taxed investors (i.e. financial institutions) who may have an advantage in detecting firm quality and ensuring that firms are well managed.

The relationship between control structures and payout is a focus of several empirical studies. Using US data, Zeckhauser and Pound (1990) do not find significant differences in payout ratios between firms with and without large block holders. Consequently, they conclude that ownership concentration and payout policy cannot be considered substitute monitoring devices. For German firms, the vast majority of which is characterized by strong investor (groups) holding majority control, Goergen et al. (2004) find evidence the dividend payout policy closely follows changes in cash flow. They argue that, given that strong shareholders exert their control power, there is no need for the dividend policy to constitute an additional monitoring device. Also for Germany, Gugler and Yurtoglu (2003) document that the power of the largest equity holder reduces the dividend payout ratio whereas the power of the second largest shareholder increases the payout. Moh'd et al. (1995) find that, in the US, more dispersed ownership (as measured by the number of owners) results in higher payout ratios. The identity of the block holders is found to affect the payout ratios as well. A high payout in companies with considerable institutional ownership is consistent with the idea that dividends are used as a way of compensating block holders for their monitoring activities (Shleifer and Vishny, 1986). Moh'd et al. (1995) document that larger managerial ownership

translates into lower dividend payout ratios, while larger institutional stakes are associated with higher payout.[8] Using UK data, Short et al. (2002) obtain a similar result and interpret it as a support for the free cash flow explanation of payout (Jensen, 1986).[9]

This concise but representative overview of the literature demonstrates that the debate on the relationship between control structures and payout policy is far from settled. Additionally, most studies only employ rather crude measures to capture the characteristics of the control structure and focus exclusively on dividends, neglecting the earnings distribution channel of share repurchases. This chapter attempts to close these gaps by considering both dividend and total payout and by applying relevant game-theoretical measures of control. It should also be noted that many of the cited papers suffer from severe econometric flaws, which are detailed in Section 5.3.2 below.

5.2.2. Hypotheses

Most of the existing agency models involving payout policy hinge on the implicit assumption that firms can be refinanced frictionlessly (without additional costs) by the external capital markets when they need funds to undertake new investment projects. Consequently, for a firm with value-enhancing investment opportunities, an optimal strategy minimizing agency costs can consist of maintaining a high payout to reduce the amount of free cash flow and of raising new outside capital. In particular, such a policy can be imposed by strong outside block holders (like corporations, or individuals or families) who intend to curb managerial propensity to overinvest. As a result, the corporate resources that can be spent by management on value reducing projects are limited. The underlying idea is that, once the free cash flow is returned to the shareholders, the external capital markets screen

[8] Eckbo and Verma (1994) test a very similar prediction employing a sample of Canadian firms. Still, in their theoretical model and the discussion of empirical results, they consider managerial preferences for high payout and institutional preferences for a low one to be largely exogenous (and not necessarily driven by the agency considerations).

[9] Also Farinha (2003) invokes agency arguments to explain the relationship between insider ownership and dividend payout in the UK.

managerial investment proposals and can impede inefficient investments by setting a prohibitive cost of capital (Easterbrook, 1984). *Therefore, I hypothesize that strong voting power held by outside shareholders like industrial firms, and families or individuals (not related to a director), increases the payout ratio (**Hypothesis 5.1**).*

Contrarily, firms in which directors hold substantial voting power may opt for low payout ratios. High earnings retention may allow managers to enjoy substantial private benefits (e.g. perquisites) associated with excess cash flow and corporate growth resulting from negative net present value projects (Jensen, 1986). According to this agency view, managers, whose control power is difficult to challenge, are able to enforce such a strategy.[10] *Thus, I hypothesize that the earnings-sensitivity of payout decreases with the voting power of executive directors (**Hypothesis 5.2**).*

The third major class of block holders is that of institutional investors (banks, insurance companies, investment funds, unit trusts, pension funds). In contrast to other outside shareholders, there is evidence that UK institutional investors are not actively monitoring the companies they invest in (Lai and Sudarsanam, 1997; Franks et al., 2001; Faccio and Lasfer, 2002). There are essentially two reasons for this lack of institutional shareholder activism. First, they do not usually have the resources to monitor the (many) firms in their portfolios. Second, monitoring would provide institutions with inside information and their investments would therefore be locked in. Hence, in case of substantial agency conflicts between managers and shareholders in a specific firm, institutions are more likely to sell (part of) their investment rather than to attempt to reduce agency conflicts by, for instance, imposing specific payout policies. Correia da Silva et al. (2004) report that UK institutions prefer high payout (in the form of dividends) for two reasons: (i) for some

[10] Managerial equity stake also helps to align the interests of management and shareholders (Jensen et al., 1992). If, due to this alignment, the severity of the manager-shareholder agency conflict is low, payout ratios in a firm with substantial managerial holdings may be low not only because managers are able to secure the funds for lavish investments, but also because the optimal financing policy requires the increase of the firm's financial slack (see below). Unfortunately, it is difficult to distinguish those two explanations empirically.

institutions, dividend payments are tax efficient[11] and (ii) high dividends facilitate the flow of funds from and to their investment portfolios. *Considering the institutions' preference for dividends (for tax reasons as well as for asset and liability considerations), I expect that the earnings-sensitivity of payout strengthens with the voting power of financial institutions* ***(Hypothesis 5.3)****.*

The discussion of the hypotheses above assumes perfect capital markets and, consequently, the independence of investment and financing decisions. Under asymmetric information, however, the market requires – even for high quality firms/projects – a premium equal to the one required for investing in the average firm (Myers and Majluf, 1984). Consequently, underinvestment problems may emerge: due to adverse selection (Akerlof, 1970) relatively lower quality projects may seek external financing whereas some of the positive NPV projects are not undertaken at all. Myers (1984) has labeled the hierarchy of financing – driven by asymmetric information and/or the real direct and indirect costs of different sources of financing – the pecking order theory. Firms finance positive NPV projects in the first instance with internal financing, subsequently with debt followed by all kinds of hybrid debt with equity components and, finally, with external equity as a last resort. Goergen and Renneboog (2001) show that a lack of internally generated funds or an excessively generous payout policy may constrain the investment expenditures of some firms. The resulting suboptimal investment policy may harm the incumbent shareholders (Gugler and Yurtoglu, 2003).

Apart from the indirect costs discussed above, raising external capital is likely to involve direct costs such as issuance costs. For instance, in case of seasoned equity offerings, the fees paid by issuing firms typically range between 1 and 10% of the value of the issue (Butler et al., 2003). The presence of such costs only reinforces the arguments of underinvestment. A policy of frequent refinancing requires a company to incur nontrivial costs of raising new capital (Myers, 1984). Moreover, even if there were no asymmetric

[11] See Chapter 4 for a detailed discussion of tax treatment of various forms of payout in the UK.

information problems, additional funds cannot be raised immediately. For instance, arranging a seasoned equity offering may well take several months. Some investments are hardly deferrable and even a temporary lack of available resources may force a firm to forego an attractive project (Fama and French, 2002).

Hence, if capital markets are imperfect, shareholders face an important tradeoff. They have to weigh the costs of overinvestment (type-I error, i.e. the projects that should not have been accepted are undertaken) against the possibility that a cash-constrained firm will not be able to undertake a profitable investment (type-II error). Enforcing a high payout policy mitigates the probability of type-I errors at a price of the higher likelihood of type-II errors in the investment policy. If the latter cost is substantial compared to the former one, outside shareholders maybe better off when firms opt for relatively low payout ratios and finance their investment internally (Jensen et al., 1992). If a firm has strong outside shareholders realizing that the firm is liquidity constrained, the payout policy may be determined more by the investment opportunities than by earnings changes. Hence, in these cases, outside block holders and financial institutions may reduce their demand for a high payout. If the effect of liquidity constraints is sufficiently strong, it may attenuate Hypotheses 5.1 and 5.3.

5.2.3. Other determinants of payout

As the choice of payout policy cannot be abstracted from the firm's investment opportunities, I include Tobin's Q as a proxy for the firm's growth opportunities in my models. Several other factors are important as well. For example, Smith and Watts (1992) document that firms with more assets-in-place tend to have higher dividend payout ratios. Company size is often considered as a proxy for firm maturity, which has been shown to affect dividend policy (Grullon et al., 2002, and Chapter 4 of this dissertation).

Leverage may also influence firms' choices of payout policy because debt also be used to alleviate potential free cash flow problems (Jensen, 1986). Moreover, some debt contracts include protective covenants limiting the payout a firm is allowed to make (in order to prevent

the expropriation of bondholders by shareholders). Therefore, I expect a negative relationship between payout ratios and leverage.[12]

Payout ratios are likely to vary considerably across industries (Moh'd et al., 1995). For instance, sectors differ as far as maturity and information opacity are concerned (Zeckhauser and Pound, 1990). This implies that the degree of free cash flow problems is bound to vary across industries. Since my sample includes firms operating in a variety of sectors (see Chapter 4, Section 4.5.1), controlling for industry-specific effects assures the reliability of the results. Finally, I also include year dummies to control for macroeconomic shocks (such as economy-wide cycles, etc.).

5.3. Data and methodology

5.3.1. Sample selection and summary statistics

Chapters 4 and 5 employ the same sample of the UK listed firms. The procedure of sample selection is described in Chapter 4 (Section 4.5.1). Table 5.1 summarizes the sample characteristics.[13] All the data are expressed in constant 1992 prices. Both the median and the average firm are profitable: their earnings before interest and taxes (EBIT) equal £ 4.2 million and £ 28.7 million, respectively. The market value of the average (median) firm equals £ 503 million (£ 73 million). The mean and median book values of total assets equal £ 301 million and £ 43 million, respectively. Because of the considerable skewness of those size measures, I employ logarithm of the book value of the total assets as a proxy for firm size. A typical firm is moderately levered – the average leverage ratios equal 59% in book-value terms and 40% in market-value terms. Finally, the sample mean and median values of Tobin's Q proxy equal 1.87 and 1.45, respectively.

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[12] On the other hand, a signaling model proposed by Ravid and Sarig (1991) predicts the opposite. Their model stipulates that, in equilibrium, high-quality firms commit to both higher payout and higher leverage than low-quality firms. Consequently, the correlation between payout and leverage is expected to be positive.

[13] The control structure of the analyzed firms is discussed below. A descriptive analysis of the payout variables can be found in Chapter 4 (Sections 4.6.1 and 4.6.2).

Table 5.1. Sample characteristics.

Variable	Mean	Median	St. dev.
Earnings (in £ thousands)	28720	4209	160391
Market value of the firm (in £ thousands)	503325	72755	2476283
Book value of the total assets (in £ thousands)	301153	43468	1445710
Firm size (log of the book value of the total assets)	4.7214	4.6382	0.7166
Leverage (in book value terms)	0.5856	0.5541	0.3597
Leverage (in market value terms)	0.3978	0.3728	0.2069
Tobin's Q	1.8724	1.4505	1.8410

Note to Table 5.1: The summary statistics are computed for the pooled sample of 5547 firm-years. All numbers are expressed in constant 1992 prices. Earnings are defined as EBIT in a particular year and are expressed in £ thousands. The market value of the firm is defined as the sum of the market value of equity and the book value of debt at the end of a given year. Firm size is defined as a natural logarithm of the book value of the total assets (expressed in £ thousands). Leverage in book value terms is defined as the ratio of total debt to the book value of the total assets and is measured at the end of the year. Leverage in market value terms is defined as the ratio of total debt to the market value of the firm and is measured at the end of the year. Tobin's Q proxy is defined as the ratio of the market value of the firm to the book value of the total assets.

Table 5.2. Distribution of equity blocks.

Variable	Mean	Median	St. dev.
Panel A: Distribution of equity blocks across different classes of shareholders			
Executive directors	0.1000	0.0000	0.1740
Financial institutions	0.1899	0.1615	0.1670
Industrial firms	0.0405	0.0000	0.1132
Non-executive directors	0.0167	0.0000	0.0608
Outside individuals	0.0231	0.0000	0.0649
Panel B: Sizes of the largest blocks			
Largest block	0.1723	0.1358	0.1586
2nd largest block	0.0733	0.0740	0.0640
3rd largest block	0.0404	0.0500	0.0437

Note to Table 5.2: Summary statistics are computed for the pooled sample of 5547 firm-years.

Chapter 4 (Section 4.5.1) details the criteria for classifying the shareholders controlling the equity blocks into different categories. Panel A of Table 5.2 illustrates the distribution of equity blocks across these classes of shareholders.[14] Financial institutions are the most important category of block holders. The average cumulative stake of this investor

[14] As illustrated in Chapter 4, those general patterns largely persist over the whole sample period.

group approximately equal that of all other block holdings combined. In an average company, institutional block holders control about one fifth of the total equity outstanding. Table 5.2 also shows that in the average sample firm, executive directors hold a non-negligible fraction of the equity outstanding, namely 10%, by means of share blocks of at least 5%. Averaging the block holdings controlled by industrial firms, I find a considerably smaller stake (of about 4%). Equity blocks held by other groups of owners (non-executive directors or outside individuals) are typically smaller. In addition to the dispersion of blocks across various types of shareholders, Table 5.2 analyses also ownership concentration *per se* (see Panel B). The average sizes of the largest, 2nd largest, and 3rd largest blocks equal 17.23%, 7.33%, and 4.04% of the equity outstanding, respectively.

As one of the focal points of this chapter is the relation between payout policy and the control power of specific types of shareholders, I construct various measures of voting control. Since the argumentation motivating the use of Banzhaf power indices in Chapter 4 applies here as well (see Section 4.5.2), I employ them also in the analyses discussed in Chapter 5. Section 4.5.2 above outlines the construction of these measures of voting power. Table 5.3 shows the absolute and relative Banzhaf indices and confirms the considerable potential of financial institutions and executive directors to influence corporate policies (see Panel A).[15] Despite the relatively small size of the largest block (on average 17.23%, see Table 5.2), the voting power of its holder is substantial (compared to the power of other block holders): on average, both the absolute and the relative indices for the largest shareholder exceed 0.5 (see Panel B of Table 5.3).

[15] In my empirical setting, I distinguish five categories of shareholders and compute the measures of voting power for each of those categories. Although Hypothesis 5.1 and 5.3 predict that the presence of blocks controlled by industrial firms, outside individuals, or financial institutions has a positive effect on payout ratios, I do not find a convincing *a priori* argument why this effect should be of the same magnitude for all those groups of shareholders. The heterogeneity may stem from differing investment motives, investment horizons, tax preferences, monitoring skills, etc. (see Chapter 4). Therefore, in the regression models discussed in Section 5.4, I include Banzhaf measures for all five categories of block holders.

Table 5.3. Voting power of the largest block holders.

Variable	Mean	Median	St. dev.
Panel A: Two-stage voting game (voting power measures for shareholder coalitions)			
Absolute Banzhaf indices			
Executive directors	0.2199	0.0000	0.3979
Financial institutions	0.5766	1.0000	0.4793
Industrial firms	0.0904	0.0000	0.2761
Non-executive directors	0.0378	0.0000	0.1706
Outside individuals	0.0508	0.0000	0.1966
Relative Banzhaf indices			
Executive directors	0.2106	0.0000	0.3926
Financial institutions	0.5670	1.0000	0.4824
Industrial firms	0.0864	0.0000	0.2712
Non-executive directors	0.0332	0.0000	0.1607
Outside individuals	0.0447	0.0000	0.1857
Panel B: One-stage voting game (voting power measures for the largest shareholders)			
Absolute Banzhaf indices			
Largest block	0.6486	0.7500	0.3754
2nd largest block	0.1432	0.0000	0.1948
3rd largest block	0.1337	0.0000	0.1843
Relative Banzhaf indices			
Largest block	0.5723	0.5000	0.3970
2nd largest block	0.0934	0.0000	0.1274
3rd largest block	0.0875	0.0000	0.1216

Note to Table 5.3: Summary statistics are computed for the pooled sample of 5547 firm-years. Construction of the Banzhaf indices is explained in Chapter 4 (Section 4.5.2).

5.3.2. Model specifications and estimation techniques

In order to analyze the dynamics of payout policy, I extend the three types of models used in the literature: the full-adjustment model (Short et al., 2002), the partial-adjustment model (Lintner, 1956), and the Waud (1966) model.[16] I estimate regressions for both dividend payout and total payout.

[16] A fourth type of payout models are the earnings trend models developed by Fama and Babiak (1968). Short et al. (2002) include ownership structure in those earnings trend models by assuming that ownership moderates the earnings generating process rather than the target payout ratio itself. As this approach is conceptually different

First, I analyze the full-adjustment model. It assumes that all that companies maintain a target payout ratio and that the shocks in earnings are reflected in payout changes in the year they occur. This gives the following regression equation:

$$D_{it} - D_{i(t-1)} = \alpha_i + \beta_1 \cdot (E_{it} - E_{i(t-1)}) + \varepsilon_{it}. \quad (5.1)$$

D_{it} denotes a payout (dividends or total payout) made by i-th company in year t. E_{it} denotes earnings (EBIT) of i-th company in year t. α_i is the firm-specific effect. β_1 is a model parameter which can be interpreted as the target payout ratio, and ε_{it} is the error term.

In order to test my hypotheses pertaining to the impact of ownership structure variables on payout ratios, I extend the specification outlined by Equation 5.1 by including as regressors k interactions of the ownership variables (e.g. Banzhaf indices for executive directors and financial institutions) with the earnings differential. I also include a vector of additional regressors (denoted by X_{it}) such as e.g. industry dummies. Thus, the regression equation describing the extended full-adjustment model can be written as:

$$D_{it} - D_{i(t-1)} = \alpha_i + \beta_1 \cdot (E_{it} - E_{i(t-1)}) + \sum_{j=1}^{k} \lambda_j \cdot Own_{j,it} \cdot (E_{it} - E_{i(t-1)}) + \gamma \cdot X_{it} + \varepsilon_{it}. \quad (5.2)$$

$Own_{j,it}$ is the value of j-th ownership variable for i-th firm in year t. λ's and the vector γ are model parameters. Since I expect the ownership variables to have an effect on target payout ratios (see Section 5.2.2), I hypothesize that λ's are significantly different from zero. My hypotheses do not impose any restrictions on the other model parameters.

The implicit assumption in the previous model is that all shocks in earnings are immediately reflected in payout changes. However, this seems to be at odds with the widely observed practice of dividend smoothing (Allen and Michaely, 2003). To model this type of payout behavior, Lintner (1956) suggests an alternative specification of the model explaining the dynamics of dividends. I use his partial-adjustment model to explain not only the dividends, but also the total payout. The basic specification is given by:

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from the other types of payout models, I do not report those estimates. Nevertheless, the earnings trend models (both with and without ownership variables) are available on request.

$$D_{it} - D_{i(t-1)} = \alpha_i + \beta_1 \cdot E_{it} + \beta_2 \cdot D_{i(t-1)} + \varepsilon_{it}, \tag{5.3}$$

where the notation is the same as in equations above. In this model, the target payout is related to earnings (E_{it}) via the desired payout ratio equal to $\frac{\beta_1}{-\beta_2}$. The immediate adjustment of actual payout to the earnings shock is only partial with a speed of adjustment given by $-\beta_2$.

As before, I extend the model specification outlined by Equation 5.3 by adding the interactions of earnings and the control variables, as well as other additional variables (X_{it}). This yields:

$$D_{it} - D_{i(t-1)} = \alpha_i + \beta_1 \cdot E_{it} + \beta_2 \cdot D_{i(t-1)} + \sum_{j=1}^{k} \lambda_j \cdot Own_{j,it} \cdot E_{it} + \gamma \cdot X_{it} + \varepsilon_{it}. \tag{5.4}$$

I re-arrange the terms in the equation above and estimate the following model in Section 5.4:

$$D_{it} = \alpha_i + \beta_1 \cdot E_{it} + (1+\beta_2) \cdot D_{i(t-1)} + \sum_{j=1}^{k} \lambda_j \cdot Own_{j,it} \cdot E_{it} + \gamma \cdot X_{it} + \varepsilon_{it}. \tag{5.5}$$

Waud (1966) suggests a specification that combines the features of full-adjustment and partial-adjustment models. He assumes that *i*-th firm's target payout in year *t* is proportional to the long-run expected earnings level. The actual payout change follows a partial-adjustment mechanism, while the formation of expectations follow an adaptive expectations model. The basic equation looks as follows:

$$D_{it} - D_{i(t-1)} = \alpha_i + \beta_1 \cdot E_{it} + \beta_2 \cdot D_{i(t-1)} + \beta_3 \cdot D_{i(t-2)} + \varepsilon_{it}. \tag{5.6}$$

The payout ratio is given by $\frac{-\beta_1}{\beta_2+\beta_3}$ with a speed of adjustment of $-(\beta_2+\beta_3)$. After extending the specification by adding the interactions of earnings and the ownership variables, as well as other additional variables (X_{it}), I get:

$$D_{it} - D_{i(t-1)} = \alpha_i + \beta_1 \cdot E_{it} + \beta_2 \cdot D_{i(t-1)} + \beta_3 \cdot D_{i(t-2)} + \sum_{j=1}^{k} \lambda_j \cdot Own_{j,it} \cdot E_{it} + \gamma \cdot X_{it} + \varepsilon_{it}. \tag{5.7}$$

Again, I re-arrange the terms in the equation above and estimate the following specification:

$$D_{it} = \alpha_i + \beta_1 \cdot E_{it} + (1+\beta_2) \cdot D_{i(t-1)} + \beta_3 \cdot D_{i(t-2)} + \sum_{j=1}^{k} \lambda_j \cdot Own_{j,it} \cdot E_{it} + \gamma \cdot X_{it} + \varepsilon_{it}. \tag{5.8}$$

Full-adjustment models (as described by Equations 5.1 and 5.2) are usual panel data regressions and can therefore be estimated by traditional estimation techniques such as fixed-effect or random-effect panel models. In the former approach, α_i's are treated as model parameters and estimated, whereas the random-effect model treats α_i's as the outcomes of random draws from a prespecified distribution (e.g. a normal one). For a data panel like mine (with a relatively large number of firms), it is advisable to use a random-effect model (Verbeek, 2000), because the number of parameters to be estimated is substantially lower with this technique. In addition, one obtains more efficient estimates from a random-effect model than from fixed-effect one. However, the consistency criterion of the random-effect approach requires α_i's to be uncorrelated with explanatory variables of the model (Baltagi, 1995). Since, in almost all my specifications, this assumption is violated, I reject the results of the random-effect models on the basis of the Hausman specification tests. Thus, all the estimates in my full-adjustment models rely on a fixed-effect approach.

Partial-adjustment and Waud model specifications are dynamic panel data models with the lagged dependent variable as a regressor. Hence, traditional estimators, such as fixed-effect within-estimators, are biased (Baltagi, 2001). This bias is the most severe when the time dimension of the panel is relatively small (as it is the case in my study). The inferences based on such estimates are likely to lead to spurious conclusions. This may be one of the main reasons for the differences in results between this chapter and some other studies (e.g. Moh'd et al., 1995; Short et al., 2002). The more appropriate methodological approach is a dynamic panel data estimation technique. Several (mostly GMM-type) estimators have been proposed in the literature to address this problem (Baltagi, 2001). The simplest estimator is based on a first-differenced equation where the differences are instrumented by lagged levels of the regressors (Arellano and Bond, 1991). However, such an estimator has been found to have large finite sample bias and poor precision in simulation studies (Blundell and Bond, 1998). This problem appears most acute in dynamic panel data models where the autoregressive parameter is moderately large and the time dimension of the panel is relatively small. Most of

the payout studies are likely to suffer from at least one of those problems. For instance, payout levels are relatively persistent, since most of the companies are reluctant to alter dramatically their dividend policy from year to year (Allen and Michaely, 2003). Furthermore, the efficiency problem stems from the fact that lagged levels of the series are weak instruments for the first differences. The Blundell and Bond (1998) approach extends the linear Arellano and Bond (1991) GMM-procedure. More specifically, the Blundell and Bond (1998) estimation technique employs lagged differences of the dependent variable as instruments for equations in levels (in addition to using levels as instruments for the differences). Blundell and Bond (1998) demonstrate that there are substantial efficiency gains resulting from the use of their system GMM estimator as compared to other dynamic panel data estimators.

I apply the GMM-in-systems estimator developed by Blundell and Bond (1998) to obtain the results for partial-adjustment and Waud models (Equations 5.5 and 5.8). DPD for Ox software is employed to estimate those models. Following Doornik et al. (2002), I use up to two lagged levels of the regressors as the instruments in the first-differenced equation (rather than using all the lags available) because remote lagged levels are likely to be weak instruments for the first differences.[17]

The estimates reported in Section 5.4 and 5.5 are the output of a two-step optimization procedure (Doornik et al., 2002). I employ Sargan test for overidentifying restrictions to assess the validity of the imposed moment conditions. A robust covariance matrix of the estimators is employed in all the reported models to account for potential heteroscedasticity. Additionally, I report the results of the autoregressive (AR) tests for residuals. These tests allow me to check for potential higher-order dependence in AR-1 and AR-2 specifications (i.e. in partial-adjustment and Waud models, respectively).

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[17] I experimented with other lag structures as well (e.g. using up to 3 or all available lags as instruments). The parameter estimates (as well as the confidence intervals) are very close to the ones reported in the text. However, the specifications with more lags require a larger number of moment restrictions to be satisfied, which affects the outcomes of the Sargan tests for overidentifying restrictions.

Table 5.4. Payout as a fraction of sales, market value, and earnings: average values.

Panel A: Payout as a fraction of market capitalization and of sales

Year	Payout as a fraction of market capitalization			Payout as a fraction of sales		
	Repurchases	Dividends	Total payout	Repurchases	Dividends	Total payout
1992	0.61 %	4.45 %	5.06 %	0.13 %	2.37 %	2.50 %
1993	0.26 %	2.47 %	2.74 %	0.22 %	2.07 %	2.30 %
1994	0.27 %	2.54 %	2.81 %	0.26 %	2.03 %	2.30 %
1995	0.20 %	2.90 %	3.12 %	0.22 %	2.24 %	2.46 %
1996	0.24 %	2.85 %	3.11 %	0.44 %	2.44 %	2.89 %
1997	0.49 %	3.53 %	4.05 %	0.52 %	2.53 %	3.06 %
1998	0.48 %	3.73 %	4.19 %	0.27 %	2.65 %	2.91 %
Total	0.35 %	3.13 %	3.49 %	0.30 %	2.30 %	2.61 %

Panel B: Payout as a fraction EBIT for all firms and for firms with positive EBIT

Year	Payout as a fraction of EBIT			Payout as a fraction of EBIT (if EBIT >0)		
	Repurchases	Dividends	Total payout	Repurchases	Dividends	Total payout
1992	1.00 %	28.07 %	29.19 %	1.78 %	38.54 %	40.32 %
1993	4.69 %	21.07 %	25.81 %	5.89 %	31.17 %	37.11 %
1994	2.92 %	26.22 %	29.23 %	3.40 %	32.21 %	35.75 %
1995	1.23 %	20.90 %	22.22 %	1.44 %	34.84 %	36.44 %
1996	2.11 %	21.93 %	24.29 %	2.53 %	36.22 %	39.18 %
1997	2.09 %	7.42 %	9.52 %	3.28 %	30.27 %	33.75 %
1998	2.41 %	11.64 %	14.19 %	2.83 %	36.79 %	40.47 %
Total	2.33 %	20.28 %	22.75 %	3.02 %	33.92 %	37.13 %

Note to Table 5.4: The last row in each panel presents the statistics for the pooled sample.

5.4. Results

5.4.1. Payout ratios

Chapter 4 (in Section 4.6) provides an extensive analysis of the general patterns in dividends and share repurchases for UK firms in the 1990s. Therefore, below I examine only the evolution of payout ratios maintained by the sample companies (which is not discussed in Chapter 4).

Table 5.4 exhibits the patterns in payout ratios for listed UK firms in the 1990s; Table 5.5 is similar but shows the payout ratios conditional on whether a firm respectively, pays dividends, repurchases shares, or does both. The payout ratios based on repurchases are

Table 5.5. The average numbers by type of payout are conditional on that type of payout being employed as an earnings distribution channel.

Panel A: Payout as a fraction of market capitalization and of sales

Year	Payout as a fraction of market capitalization			Payout as a fraction of sales		
	Repurchases	**Dividends**	**Total payout**	**Repurchases**	**Dividends**	**Total payout**
1992	13.12 %	5.31 %	6.00 %	2.69 %	2.84 %	2.98 %
1993	5.71 %	3.03 %	3.31 %	4.74 %	2.54 %	2.78 %
1994	6.12 %	3.01 %	3.31 %	5.73 %	2.42 %	2.72 %
1995	5.04 %	3.38 %	3.61 %	5.33 %	2.61 %	2.86 %
1996	3.78 %	3.34 %	3.61 %	6.89 %	2.87 %	3.37 %
1997	5.41 %	4.09 %	4.65 %	5.75 %	2.94 %	3.53 %
1998	4.32 %	4.08 %	4.51 %	2.40 %	2.92 %	3.13 %
Total	5.99 %	3.69 %	4.08 %	5.19 %	2.72 %	3.06 %

Panel B: Payout as a fraction of EBIT for all firms and for firms with positive EBIT

Year	Payout as a fraction of EBIT			Payout as a fraction of EBIT (if EBIT >0)		
	Repurchases	**Dividends**	**Total payout**	**Repurchases**	**Dividends**	**Total payout**
1992	21.31 %	33.62 %	34.77 %	41.21 %	43.06 %	44.97 %
1993	100.21 %	25.91 %	31.34 %	119.75 %	35.25 %	41.56 %
1994	64.14 %	31.29 %	34.63 %	67.59 %	35.84 %	39.51 %
1995	29.95 %	24.48 %	25.92 %	31.69 %	38.24 %	39.90 %
1996	33.22 %	25.86 %	28.31 %	38.55 %	39.97 %	42.96 %
1997	22.97 %	8.63 %	10.97 %	33.59 %	32.70 %	36.29 %
1998	21.66 %	12.65 %	15.25 %	23.02 %	37.82 %	41.40 %
Total	39.81 %	23.99 %	26.70 %	48.87 %	37.39 %	40.74 %

Note to Table 5.5: The last row in each panel presents the statistics for the pooled sample.

more volatile than those for dividend payments (or the total payout). Panel A of Table 5.4 shows that the average dividend yield equals 3.13% (3.69% for the subsample of dividend-paying firms, as shown in Table 5.5). When share repurchases are also taken into account, the average paying firm distributes to shareholders slightly more than 4% of its market value. On average, the total payout amounts to 2.30% of sales revenues in the population of firms (2.72% for payers; as shown in Table 5.5). These ratios as well as dividend yields remain considerably more stable than payout ratios computed with respect to earnings. Panels B of Tables 5.4 and 5.5 show that total payout as a fraction of earnings oscillates around 20-25%

(around 40% if only firms with positive earnings are considered).[18] In the next section, I examine the impact of the control structure on those payout ratios.

5.4.2. Dynamics of payout-profitability relationship

My estimation results demonstrate that the full-adjustment models are misspecified both for the dividend and the total payout. Hardly any of the regression specifications passes the test for joint significance of the model parameters. Furthermore, the implied payout ratios from these models do not match the observed ones (reported in Table 5.4). Finally, the results of AR-tests indicate considerable degree of residual autocorrelation, which suggests that changes in firm payout policy reflect not only contemporaneous, but also some past shocks in profitability. From these findings, I conclude that full-adjustment models do not capture the payout policy dynamics well. Hence, I do not report the estimates for this type of models,[19] but turn directly to the partial-adjustment and Waud models.

Tables 5.6 and 5.7 present the estimation results for partial-adjustment models explaining the dynamics of dividends and of the total payout, respectively. In each table, the first model reported corresponds to the basic specification (without variables characterizing firms' ownership structure), while the other two regressions are the extended specifications as described by Equation 5.5.

For the basic dividend model (Model 5.1 in Table 5.6), the Sargan test indicates that (at the conventional 5% significance level) the reported estimates fail to match the moment conditions imposed by the GMM-based Blundell and Bond (1998) procedure. Hence, I do not interpret the corresponding estimation results and report them for reasons of comparison only. The basic model for the total payout (Model 5.4 in Table 5.7) passes the Sargan test, but it

[18] This number should be contrasted with the payout ratio based on repurchases only. In the analyzed period, only a tiny fraction of aggregate firm earnings (on average 2.33%) was distributed to shareholders via share buyback programs.

[19] The corresponding estimation results are available upon request.

Table 5.6. Partial-adjustment models explaining dividend dynamics.

	Model 5.1		**Model 5.2**		**Model 5.3**	
Voting power measure applied	None		Banzhaf absolute index		Banzhaf relative index	
Variable	**Estimate**	**t-statistic**	**Estimate**	**t-statistic**	**Estimate**	**t-statistic**
Lagged dividend	0.31	2.19*	0.27	1.86†	0.27	1.90†
Earnings	0.09	3.51***	0.23	4.12***	0.23	4.16***
Firm size	15934.90	2.25*	13751.30	2.19*	13231.90	2.15*
Tobin's Q proxy	430.36	1.64	307.19	1.24	292.74	1.21
Leverage	6509.71	2.12*	6647.89	1.92†	5985.20	2.17*
Earnings * Voting power of industrial firms			-0.21	-2.62**	-0.21	-2.61**
Earnings * Voting power of outside individuals			-0.25	-1.96*	-0.29	-2.08*
Earnings * Voting power of non-executive directors			-0.16	-2.01*	-0.26	-2.50*
Earnings * Voting power of executive directors			-0.14	-2.13*	-0.14	-2.09*
Earnings * Voting power of financial institutions			-0.13	-3.12**	-0.13	-3.14**
Year dummies	Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes	
No. of observations	4435		4435		4435	
No. of firms	928		928		928	
Wald test	$\chi^2(5) = 239.60^{***}$		$\chi^2(10) = 1314.00^{***}$		$\chi^2(10) = 1280.00^{***}$	
Sargan test	$\chi^2(69) = 95.20^{*}$		$\chi^2(139) = 163.60^{\dagger}$		$\chi^2(139) = 156.00$	
AR(1) test z-statistic	$-1.71^{\dagger}$		$-1.72^{\dagger}$		$-1.72^{\dagger}$	
AR(2) test z-statistic	0.55		0.99		0.99	

Note to Table 5.6: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% confidence level, respectively. Robust covariance matrix estimator is used to compute the t-statistics reported. Wald statistics are computed to verify joint significance of the model variables (other than year and industry dummies). The Sargan test for overidentifying restrictions verifies the appropriateness of moment conditions imposed in the estimation procedure. AR-test statistics asymptotically have a standard normal distribution. Year dummies determine the constant. All the numbers are expressed in constant 1992 prices. Dividends are expressed in £ thousands. Earnings are defined as EBIT in a particular year and are expressed in £ thousands. Firm size is defined as a natural logarithm of the book value of the total assets (expressed in £ thousands). Leverage is expressed in book value terms. It is defined as the ratio of total debt to the book value of the total assets and is measured at the end of the year. Tobin's Q proxy is defined as the ratio of the market value of the firm to the book value of the total assets. Construction of the voting power measures is explained in Chapter 4 (Section 4.5.2).

Table 5.7. Partial-adjustment models explaining the dynamics of the total payout.

	Model 5.4		**Model 5.5**		**Model 5.6**	
Voting power measure applied	None		Banzhaf absolute index		Banzhaf relative index	
Variable	**Estimate**	**t-statistic**	**Estimate**	**t-statistic**	**Estimate**	**t-statistic**
Lagged payout	0.37	2.87**	0.30	2.79**	0.30	2.81**
Earnings	0.06	1.61	0.19	2.59**	0.20	2.60**
Firm size	17541.00	1.39	19427.50	2.46*	19681.40	2.03*
Tobin's Q proxy	779.51	1.55	653.10	1.48	279.76	0.20
Leverage	7260.33	1.38	10475.90	2.06*	9720.85	1.64
Earnings * Voting power of industrial firms			-0.29	-2.42*	-0.28	-2.64**
Earnings * Voting power of outside individuals			-0.26	-1.69†	-0.30	-1.70†
Earnings * Voting power of non-executive directors			-0.16	-1.71†	-0.25	-2.05*
Earnings * Voting power of executive directors			-0.10	-1.33	-0.11	-1.40
Earnings * Voting power of financial institutions			-0.08	-1.28	-0.09	-1.30
Year dummies	Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes	
No. of observations	4394		4394		4394	
No. of firms	918		918		918	
Wald test	$\chi^2(5) = 107.80^{***}$		$\chi^2(10) = 691.00^{***}$		$\chi^2(10) = 571.60^{***}$	
Sargan test	$\chi^2(69) = 75.40$		$\chi^2(139) = 157.40$		$\chi^2(139) = 78.96$	
AR(1) test z-statistic	-2.07*		-2.03*		-2.00*	
AR(2) test z-statistic	1.58		1.56		1.55	

Note to Table 5.7: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% confidence level, respectively. Robust covariance matrix estimator is used to compute the t-statistics reported. Wald statistics are computed to verify joint significance of the model variables (other than year and industry dummies). The Sargan test for overidentifying restrictions verifies the appropriateness of moment conditions imposed in the estimation procedure. AR-test statistics asymptotically have a standard normal distribution. Year dummies determine the constant. All the numbers are expressed in constant 1992 prices. Total payouts are expressed in £ thousands. Earnings are defined as EBIT in a particular year and are expressed in £ thousands. Firm size is defined as a natural logarithm of the book value of the total assets (expressed in £ thousands). Leverage is expressed in book value terms. It is defined as the ratio of total debt to the book value of the total assets and is measured at the end of the year. Tobin's Q proxy is defined as the ratio of the market value of the firm to the book value of the total assets. Construction of the voting power measures is explained in Chapter 4 (Section 4.5.2).

does not describe the dynamics of the dependent variable satisfactorily. As to the t-statistics, only the lagged payout variable is significant at 5% level, which suggests path-dependence in payout policies. Surprisingly, the coefficient corresponding to the earnings falls short of statistical significance, though it is positive as expected.

The partial-adjustment models including the ownership variables (Models 5.2-5.3 and 5.5-5.6) perform considerably better in statistical terms and capture the dynamics of dividends and total payout reasonably well (with realistic implied payout ratios). For instance, Model 5.2 implies that for a widely held firm (i.e. for a firm where the measures of voting power for all block holders' coalitions take a value of zero), the target dividend payout ratio equals 31.9% (i.e. $\frac{0.23}{1-0.27}$; see Section 5.3.2), which exceeds the sample average (i.e. 20.3%; see Panel B of Table 5.4). The same model implies that in a firm controlled by financial institutions (i.e. a firm where Banzhaf measure for this group of investors equals one, while voting power of other coalitions is zero), the target dividend payout ratio is much lower and amounts to 14.3% only. With regard to the total payout policy, the results imply that the corresponding numbers for the total payout ratio equal 27.3% for a widely-held firm and 15.6% for a firm controlled by financial institutions. These implied payout ratios are reasonably close to the observed average (i.e. 22.8%).

Changes in earnings translate only gradually into (dividend) payout adjustments. The coefficients for the lagged dividends and lagged total payout are significant in the models reported in Tables 5.6 and 5.7, respectively. Therefore, the models seem to be consistent not only with 'dividend smoothing', but also – more generally – with 'payout smoothing'.

The estimates of the coefficients corresponding to the interactions between profitability and the power of industrial firms as well as between profitability and the power of individual block holders are negative and at least marginally significant in the models reported in Tables 5.6 and 5.7. Hence, contrary to which was predicted by Hypothesis 5.1, outside shareholders seem to prefer relatively low payout ratios and to approve shielding of payout from earnings shocks. This result is consistent with the implications of the financial

constraints model (see Section 5.2.2). Apparently, large outside shareholders acknowledge the potential cost of underinvestment and allow firms to extend their financial slack. At the same time, as those shareholders are likely to actively monitor the management (see Section 5.2.2), they can curb potential overinvestment problems in firms with substantial free cash flow.

As predicted by Hypothesis 5.2, the interaction of earnings and the voting power enjoyed by executive directors is significantly negative in dividend models (Models 5.2 and 5.3).[20] Apparently, strong managers are able to weaken the positive link between corporate profitability and dividend payout. The values of estimates imply that in firms where executive directors constitute a controlling block holder coalition (with corresponding Banzhaf indices equal to 1), the implied payout ratio is less than a half the payout ratio of a widely held firm.[21]

As indicated by Models 5.2 and 5.3 (Table 5.6) the dividend payout ratio tends to be significantly lower in firms with dominating financial institutions than in widely-held firms (although the corresponding coefficients in the total payout models are not statistically significant; see Table 5.7). Somewhat surprisingly, the tax preference for dividends by financial institutions is not a dominating decision criterion; it seems that this type of block holders realizes the costs of excessive payout and is ready to mitigate their demand for a high dividend payout (in spite of their tax advantages).[22] Consequently, the evidence fails to support Hypothesis 5.3.

Models 5.1-5.6 also illustrate the impact of other firm characteristics on the dynamics of payout. In line with my earlier expectations, larger firms distribute more funds to their shareholders than small firms do. Unexpectedly, the firms' investment opportunities seem not

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[20] The corresponding coefficients are also negative in Models 5.5 and 5.6 that explain the dynamics of total payout (see Table 5.7), though they fall short of statistical significance.

[21] Notably, a similar (yet stronger) effect can be observed for the power of non-executive directors. Substantial voting power of this group of shareholders significantly weakens the earnings-sensitivity of payout. The magnitude of this effect is comparable to that for outside block holders (see above).

[22] Importantly, the fact that block holders prefer payout not to be sensitive to earning changes does not necessarily imply that this payout should be as low as zero (cf. Chapter 4). The results suggest that block holders (irrespectively of their type) are pleased with a stable payout policy (not affected by short-run earnings shocks).

to matter for the payout decisions as the impact of the Tobin's Q proxy appears insignificant in any of the models reported in Tables 5.6 and 5.7. Finally, payout decisions and leverage are significantly and positively related (in line with the predictions of the model by Ravid and Sarig, 1991): more levered firms maintain higher payout than less levered firm do.

Tables 5.8 and 5.9 present the estimation results for the Waud models, explaining the dynamics of dividends and of the total payout, respectively (see Equation 5.8). None of the models seem to capture the dynamics of payout variables well. Throughout the specifications, the coefficients corresponding to the lagged dependent variables are positive (as expected) yet hardly significant.[23] Consequently, this empirical evidence does not support more complicated adjustment mechanisms implicit in the Waud specification.[24] Still, despite a relatively weak fit of the Waud models presented in Tables 5.8 and 5.9, the qualitative results reported in Tables 5.6 and 5.7 for partial-adjustment models are largely upheld. In particular, considerable voting power enjoyed by any of the analyzed categories of block holder has a negative impact on payout ratios. In the Waud models, the results pertaining to the impact of other firm characteristics (such as firm size, investment opportunities, leverage) on payout are virtually the same as those discussed earlier for the partial-adjustment models.

5.5. Extensions and robustness checks

In the previous section, I have not found support for the more complex adjustment mechanism postulated by the Waud models, while the partial-adjustment models prove relatively successful in explaining the dynamics of dividends and the total payout. Therefore,

[23] Moreover, Models 5.8 and 5.10 do not pass the Sargan test for overidentifying restrictions.

[24] Also some of the implied payout ratios appear to be at odds with the numbers reported in Table 5.4. Dividend and total payout ratios implied by Models 5.7 and 5.10, respectively, equal 7.3% and 6.1% only, which is an even larger underestimation than the one reported above for Models 5.1 and 5.4. Models 5.8, 5.9, 5.11, and 5.12 produce more plausible values.

Table 5.8. Waud models explaining dividend dynamics.

	Model 5.7		**Model 5.8**		**Model 5.9**	
Voting power measure applied	None		Banzhaf absolute index		Banzhaf relative index	
Variable	**Estimate**	**t-statistic**	**Estimate**	**t-statistic**	**Estimate**	**t-statistic**
Dividend lagged 1 year	0.43	1.68†	0.16	0.57	0.16	0.60
Dividend lagged 2 years	0.19	0.87	0.26	1.41	0.27	1.40
Earnings	0.03	0.54	0.24	5.41***	0.24	5.42***
Firm size	13316.40	1.57	13216.10	2.00*	11067.70	2.45*
Tobin's Q proxy	429.25	0.97	386.60	1.27	310.72	1.13
Leverage	5293.81	1.25	5445.77	1.64	4086.17	2.18*
Earnings * Voting power of industrial firms			-0.27	-3.92***	-0.26	-4.22***
Earnings * Voting power of outside individuals			-0.23	-2.11*	-0.29	-2.90**
Earnings * Voting power of non-executive directors			-0.10	-0.80	-0.26	-2.44*
Earnings * Voting power of executive directors			-0.16	-3.28**	-0.16	-3.35**
Earnings * Voting power of financial institutions			-0.16	-5.62***	-0.16	-5.43***
Year dummies	Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes	
No. of observations	3445		3445		3445	
No. of firms	879		879		879	
Wald test	$\chi^2(6) = 84.97^{***}$		$\chi^2(11) = 1071.00^{***}$		$\chi^2(11) = 1084.00^{***}$	
Sargan test	$\chi^2(57) = 66.33$		$\chi^2(117) = 146.20^{*}$		$\chi^2(117) = 130.70$	
AR(1) test z-statistic	-1.13		-1.03		-0.99	
AR(2) test z-statistic	-1.32		-1.46		-1.45	
AR(3) test z-statistic	1.06		0.64		0.63	

Note to Table 5.8: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% confidence level, respectively. Robust covariance matrix estimator is used to compute the t-statistics reported. Wald statistics are computed to verify joint significance of the model variables (other than year and industry dummies). The Sargan test for overidentifying restrictions verifies the appropriateness of moment conditions imposed in the estimation procedure. AR-test statistics asymptotically have a standard normal distribution. Year dummies determine the constant. Variables are defined in the same way as those used in the models reported in Table 5.6.

in my discussion of model extensions, I focus on some modifications of the partial-adjustment models only.

Table 5.9. Waud models explaining the dynamics of the total payout.

	Model 5.10		**Model 5.11**		**Model 5.12**	
Voting power measure applied	None		Banzhaf absolute index		Banzhaf relative index	
Variable	**Estimate**	**t-statistic**	**Estimate**	**t-statistic**	**Estimate**	**t-statistic**
Dividend lagged 1 year	0.30	0.92	0.16	0.73	0.15	0.69
Dividend lagged 2 years	0.28	1.21	0.29	1.60	0.29	1.80†
Earnings	0.03	0.59	0.19	2.65**	0.20	2.74**
Firm size	18077.00	2.21*	20506.80	2.41*	22177.90	2.46*
Tobin's Q proxy	461.78	0.64	591.53	0.81	-118.72	-0.12
Leverage	7332.36	1.60	10386.50	2.34*	8278.32	1.27
Earnings * Voting power of industrial firms			-0.32	-2.83**	-0.31	-2.85**
Earnings * Voting power of outside individuals			-0.27	-2.06*	-0.29	-2.10*
Earnings * Voting power of non-executive directors			-0.12	-0.95	-0.25	-1.91†
Earnings * Voting power of executive directors			-0.12	-1.67†	-0.13	-1.72†
Earnings * Voting power of financial institutions			-0.11	-1.84†	-0.12	-1.83†
Year dummies	Yes		Yes		Yes	
Industry dummies	Yes		Yes		Yes	
No. of observations	3421		3421		3421	
No. of firms	875		875		875	
Wald test	$\chi^2(6) = 110.50^{***}$		$\chi^2(11) = 422.50^{***}$		$\chi^2(11) = 341.30^{***}$	
Sargan test	$\chi^2(57) = 77.19^{*}$		$\chi^2(117) = 139.40^{\dagger}$		$\chi^2(117) = 65.45$	
AR(1) test z-statistic	-0.84		-0.61		-0.58	
AR(2) test z-statistic	-0.63		-0.33		-0.37	
AR(3) test z-statistic	1.01		0.51		0.45	

Note to Table 5.9: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% confidence level, respectively. Robust covariance matrix estimator is used to compute the t-statistics reported. Wald statistics are computed to verify joint significance of the model variables (other than year and industry dummies). The Sargan test for overidentifying restrictions verifies the appropriateness of moment conditions imposed in the estimation procedure. AR-test statistics asymptotically have a standard normal distribution. Year dummies determine the constant. Variables are defined in the same way as those used in the models reported in Table 5.7.

5.5.1. One-stage voting game

The theoretical considerations summarized in Section 5.2.2 imply that the preferences with respect to the payout policy differ by type of shareholder. However, my empirical results

do not support such a prediction. In relation to the corporate earnings distribution policy, block holders appear to behave similarly (at least, from a qualitative point of view) irrespectively of their identity. This finding may suggest that my two-stage approach to the voting game may be incorrect. Rather than forming type-based coalitions first, and participating in the voting game only afterwards, block holders may attempt to achieve their payout policy goals on their own. In the models summarized in Tables 5.10 and 5.11 below, I verify such a claim empirically. I consider a one-stage oceanic voting game, where each block holder is treated as a separate player. Then, I compute the corresponding Banzhaf indices to measure block holders' voting power. I employ those measures and re-estimate partial-adjustment models for the dividends and for the total payout.

In Models 5.13-5.16 (see Tables 5.10 and 5.11), I include the measures of voting power for the two largest block holders.[25] The results obtained here demonstrate the pattern similar to those obtained earlier for block holder coalitions. The presence of a large shareholder considerably decreases the implied payout ratios, in particular when dividends are considered.[26] For instance, Model 5.13 implies a dividend payout ratio of 32.2% for a widely-held firm, while for a firm with median control concentration the corresponding number amounts to merely 18.5%. The direction of the effect is the same for both the largest and the second largest shareholder, which distinguishes my results from those obtained by Gugler and Yurtoglu (2003) for Germany.[27] In contrast to the German firms most of which are dominated by one shareholder with an absolute voting majority, the overwhelming majority of my sample firms are minority-controlled: only about 6% of the companies analyzed here have a

[25] I estimated the models where I considered also the power of the third largest shareholder, but the corresponding coefficients for the interactions of Banzhaf indices with the earnings proved insignificant.

[26] Moreover, it appears that it is not just the most powerful shareholder who tries to impose a specific payout policy. In a typical company, a coalition of at least two leading shareholders influences the choice of the payout ratio.

[27] In their study, the control power of the largest equity holder reduces the dividend payout ratio whereas the control power of the second largest shareholder increases the payout.

Table 5.10. Partial-adjustment models explaining dividend dynamics.

	Model 5.13		**Model 5.14**	
Voting power measure applied	Banzhaf absolute index		Banzhaf relative index	
Variable	**Estimate**	**t-statistic**	**Estimate**	**t-statistic**
Lagged dividend	0.30	2.12*	0.30	2.11*
Earnings	0.23	3.70***	0.23	3.70***
Firm size	12398.60	1.99*	12701.70	1.97*
Tobin's Q proxy	290.21	1.41	294.78	1.40
Leverage	5862.88	1.93†	5819.30	1.83†
Earnings * Voting power of the largest shareholder	-0.13	-2.83**	-0.13	-2.84**
Earnings * Voting power of the 2nd largest shareholder	-0.21	-2.49*	-0.36	-2.26*
Year dummies	Yes		Yes	
Industry dummies	Yes		Yes	
No. of observations	4435		4435	
No. of firms	928		928	
Wald test	$\chi^2(7) = 668.10^{***}$		$\chi^2(7) = 673.20$	
Sargan test	$\chi^2(97) = 118.70^{\dagger}$		$\chi^2(97) = 131.10^{*}$	
AR(1) test z-statistic	-1.65†		-1.66†	
AR(2) test z-statistic	1.00		1.00	

Note to Table 5.10: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% confidence level, respectively. Robust covariance matrix estimator is used to compute the t-statistics reported. Wald statistics are computed to verify joint significance of the model variables (other than year and industry dummies). The Sargan test for overidentifying restrictions verifies the appropriateness of moment conditions imposed in the estimation procedure. AR-test statistics asymptotically have a standard normal distribution. Year dummies determine the constant. The construction of the voting power measures is outlined in Chapter 4 (Section 4.5.2). Other variables are defined in the same way as those used in the models reported in Table 5.6.

majority owner. Consequently, it is difficult to compare my qualitative results with those obtained by Gugler and Yurtoglu (2003), as their conclusions are largely based on the comparisons of two types of majority-controlled firms and a group of companies without a majority block holder. In this chapter, I apply a more refined measure of block holders' power and I document that within minority-controlled firms, a strong relationship between ownership concentration and chosen payout policies can be observed.[28] Finally,

[28] In the robustness checks (not reported), I find that the results of Chapter 5 are not driven by observations on firms that have a majority shareholder.

Table 5.11. Partial-adjustment models explaining the dynamics of the total payout.

	Model 5.15		**Model 5.16**	
Voting power measure applied	Banzhaf absolute index		Banzhaf relative index	
Variable	**Estimate**	**t-statistic**	**Estimate**	**t-statistic**
Lagged payout	0.33	3.02**	0.33	3.05**
Earnings	0.19	2.52*	0.19	2.51*
Firm size	16575.70	1.97*	16741.70	2.07*
Tobin's Q proxy	598.18	1.49	587.29	1.42
Leverage	6399.31	1.78†	6717.61	1.89†
Earnings * Voting power of the largest shareholder	-0.09	-1.32	-0.09	-1.30
Earnings * Voting power of the 2nd largest shareholder	-0.14	-1.02	-0.26	-1.19
Year dummies	Yes		Yes	
Industry dummies	Yes		Yes	
No. of observations	4394		4394	
No. of firms	918		918	
Wald test	$\chi^2(7) = 531.10$***		$\chi^2(7) = 540.50$***	
Sargan test	$\chi^2(97) = 108.40$		$\chi^2(97) = 113.50$	
AR(1) test z-statistic	-2.00*		-2.00*	
AR(2) test z-statistic	-1.55		-1.55	

Note to Table 5.11: †, *, **, and *** denote significance at 10, 5, 1, and 0.1% confidence level, respectively. Robust covariance matrix estimator is used to compute the t-statistics reported. Wald statistics are computed to verify joint significance of the model variables (other than year and industry dummies). The Sargan test for overidentifying restrictions verifies the appropriateness of moment conditions imposed in the estimation procedure. AR-test statistics asymptotically have a standard normal distribution. Year dummies determine the constant. The construction of the voting power measures is outlined in Chapter 4 (Section 4.5.2). Other variables are defined in the same way as those used in the models reported in Table 5.7.

Models 5.13-5.16 support the earlier results pertaining to the impact of the other firm characteristics on payout. Payout is higher in larger and more levered firms, while Tobin's Q proxy does not appear to affect the amount of funds that are distributed to shareholders.

5.5.2. Other extensions and robustness checks

I tried several model specifications alternative to those reported in the text. First, I verified whether the payout adjustment to earning changes is symmetric for positive and negative shocks to profitability. Following Gugler and Yurtoglu (2003), I allowed for

adjustment of payout to earning changes to be asymmetric, but the models obtained were strongly rejected. Second, I tried alternative proxies for some of the variables. For instance, rather than employing leverage, I estimated the models that incorporate interest coverage as a regressor. Since high interest obligations may reduce the amount of funds available for payout to shareholders, I expect the parameter corresponding to this variable to be negative. I do not find the support for such a claim, since the estimate is insignificant while the remaining results remain similar to those reported.

5.6. Conclusions

I analyze a large panel of UK firms for the 1990s and find that the payout policy is significantly related to control concentration. The application of the state-of-the-art dynamic panel data estimation procedure allows me to avoid biases plaguing many empirical studies of corporate payout. The analysis of payout dynamics reveals that companies adjust payout policies to earnings changes only gradually, which is consistent with the 'dividend smoothing' documented in the literature. In fact, my results suggest a presence of a more general phenomenon of the 'total payout smoothing'.

Profitability indeed drives payout decisions of the analyzed companies, but the presence of strong block holders or block holder coalitions weakens the relationship between the corporate earnings and the payout dynamics. Chapter 5 also contributes to the methodological debate on the measurement of voting power. I advocate the use of Banzhaf indices as a relevant measure of voting power in analyses of corporate policy choices. According to my best knowledge, together with Chapter 4, it is the first study employing those game theory-based concepts in the context of corporate payout policies.

The reduced earnings sensitivity of dividends in the presence of control concentration suggests that controlling shareholders trade off the agency costs of free cash flow against the risk of underinvestment. Strong block holders (or a block holder coalition) mitigate the agency conflict between management and shareholders and, consequently, render the internal

sources of financing attractive. At the same time, block holders appear to realize that overly generous payout may render the company to be liquidity constrained, and, consequently, result in suboptimal investment policy. Thus, the results challenge some of the implications of the agency theories of payout, and favor a pecking-order explanation for the observed patterns. While the impact of the voting power of shareholders' coalitions on payout ratios is found to be always negative, the magnitude of this effect differs across different categories of block holders (i.e. industrial firms, outside individuals, directors, financial institutions). In particular, industrial firms and outside individuals are those groups of block holders that appear most likely to restrain their demand for high payout.

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Samenvatting (Dutch Summary)

De aanwezigheid van belangentegenstellingen tussen aandeelhouders en managers, die de middelen van de onderneming beheren, heeft geleid tot de opkomst van corporate governance mechanismen die financiers verzekeren van het feit dat fondsen niet worden misbruikt of worden uitgegeven aan onaantrekkelijke projecten (Jensen en Meckling, 1976; Shleifer en Vishny, 1997). In een groot aantal Europese landen is de eigendomsstructuur een van de belangrijkste interne mechanismen van corporate governance (Becht en Roell, 1999; La Porta et al., 1999). De bescherming van aandeelhouders met een minderheidsbelang is in deze landen zwakker dan in Anglo-Amerikaanse landen (La Porta et al., 1998) en daarom verschaffen alleen groot-aandeelhouders met een significante invloed een voldoende bescherming voor investeerders. Desalniettemin, zelfs in landen als de Verenigde Staten en de het Verenigd Koninkrijk wordt beargumenteerd dat de aanwezigheid van een groot-aandeelhouder de waarde van de onderneming (Morck et al., 1988; McConnel en Servaes, 1990 en 1995) en de efficiëntie van governance mechanismen beïnvloedt (Moh'd et al., 1995, Denis et al., 1997; Franks et al., 2001; Farinha, 2003).

De theoretische literatuur benadrukt dat de aanwezigheid van een groot-aandeelhouder voordelen verschaft, maar ook nadelen met zich kan meebrengen. Shleifer en Vishny (1986) en Kyle en Vila (1991) suggereren dat de aanwezigheid van een groot-aandeelhouder in de eigendomsstructuur van een onderneming mogelijkheden biedt voor waarde vermeerderende overnames, waardoor het free-rider probleem van Grossman en Hart (1980) kan worden ontlopen. Daarnaast tonen Admati et al. (1994), Maug (1998), Kahn en Winton (1998) aan dat in aanwezigheid van groot-aandeelhouders kostbaar toezicht houden plaatsvindt, ondanks het free-riding gedrag van "dispersed" aandeelhouders. Echter, de kosten van een

geconcentreerde eigendomsstructuur kunnen substantieel zijn. Allereerst, bestuur door middel van een groot-aandeelhouder reduceert de mogelijkheden tot het delen van risico (Demsetz en Lehn, 1985; Admati et al., 1994). Ten tweede, de concentratie van aandelen beperkt de liquiditeit in de markt (Coffee, 1991; Bolton en Thadden, 1998). Ten derde, wanneer toezicht wordt gehouden door een investeerder met een aandelenbelang kan dit leiden tot het nemen van excessief risico bij beleidsbeslissingen, in het bijzonder in ondernemingen met een aanzienlijke fractie vreemd vermogen (Jensen en Meckling, 1976; Coffee, 1991). Tenslotte, Burkart et al. (1997) en Pagano en Roell (1998) wijzen erop dat ondanks het feit dat een strakke besturing door aandeelhouders ex post efficiënt is, dit ex ante een bedreiging tot uitbuiting teweeg kan brengen die de incentives van de manager om een inspanning te leveren en waarde vermeerderende strategieën te ondernemen kunnen reduceren (het zogenaamde "over-monitoring" effect).

Deze dissertatie richt zich op de voor- en nadelen van eigendomsconcentratie. De dissertatie bestaat uit vier essays die de rol van bestuursstructuren van aandeelhouders in verschillende corporate governance regimes onderzoeken. Hoofdstuk 2 bekijkt de effecten van transacties van grote aandelenpakketten en gebruikt de agency theorie om de determinanten van equity block premies te verklaren. Een steekproef van transacties in Polen wordt gebruikt om de voor- en nadelen van eigendomsconcentratie te meten. De premies blijken aanzienlijk lager te zijn dan in goed ontwikkelde markten, ondanks de zwakkere bescherming van "minority" aandeelhouders in opkomende economieën. Aandeelhouders verwachten te profiteren van intensiever toezicht en herstructurering van de onderneming als gevolg van het verwerven van grote aandelenpakketten. Desondanks zijn aandeelhouders nog altijd behoedzaam voor uitbuiting ten gevolge van het feit dat groot-aandeelhouders privé voordelen kunnen uitbouwen en dus waarde ontrekken aan de onderneming. De mogelijkheden om dergelijke voordelen te onttrekken hangen niet slechts af van de fractie van de groot-aandeelhouder, maar ook van de relatieve kracht van de overige investeerders.

Tenslotte geven de resultaten een positieve rol aan voor de overheid als investeerder in beursgenoteerde ondernemingen.

Hoofdstuk 3 analyseert simultaan twee mechanismen van de arbeidsmarkt voor managers: de vervanging van een CEO en de financiële beloningsstructuren. Sample selection modellen en hazard analyses worden toegepast op een aselecte steekproef van 250 ondernemingen die zijn genoteerd aan de London Stock Exchange. Mijn benadering verschaft nieuwe resultaten (in vergelijking met eerder UK onderzoek): zowel de financiële beloningsstructuur van de CEO en de vervanging van de CEO zijn sterk prestatie afhankelijk. Er is weinig bewijs dat outside shareholders toezicht houden, terwijl CEOs met veel zeggenschap op succesvolle wijze weerstand kunnen bieden aan vervanging, ongeacht de prestaties van de onderneming. Met betrekking tot de waardering van CEOs, schetsen het managerial power model van Bebchuk en Fried (2003) en het skimming model van Bertrand en Mullainathan (2000) een beter beeld van de waardering van managers in het Verenigd Koninkrijk dan de contractual alignment of interests theorie van de traditionele agency literatuur (e.g. Murphy, 1986) omwille van de volgende redenen. (i) CEOs met veel zeggenschap selecteren hun eigen standaard (accounting performantie), terwijl in geval van ondernemingen met sterke outside block holders, de beloning wordt gekoppeld aan de waardecreatie voor de aandeelhouders, (ii) de aanwezigheid van een waarderingscommissie heeft geen invloed op de waardering, (iii) CEOs, die aandelen bezitten, compenseren tegenvallende beleggingsresultaten door een hogere beloning in termen van cash toe te kennen (salaris en bonus), wat self-dealing suggereert.

Hoofdstuk 4 beschouwt de payout policy van UK ondernemingen, die zijn genoteerd op de London Stock Exchange gedurende de jaren 90. Het vult de bestaande payout studies aan door simultaan de trends in dividenden en het inkopen van eigen aandelen te analyseren. In tegenstelling tot in de Verenigde Staten (Fama en French, 2001), vind ik voor het Verenigd Koninkrijk dat ondernemingen geen afnemende neiging hebben om fondsen te verdelen onder aandeelhouders. De rol van share repurchases is toenemend, maar dividenden vormen nog

altijd een fors deel van de totale uitbetaling. Ondernemingen die share repurchases uitvoeren betalen in het algemeen ook dividenden uit. Tevens documenteer ik dat er een sterke relatie is tussen de aanwezigheid van groot-aandeelhouders en de keuze van het payout kanaal: ondernemingen met een geconcentreerde eigendomsstructuur kiezen voor dividenden in plaats van share repurchases, ongeacht de identiteit van de bepalende aandeelhouder. Ik beargumenteer dat zowel de verschillende belasting van dividenden en koerswinsten als insider trading regulering de relatieve aantrekkelijkheid van dividenden en share repurchases voor grote investeerders kan beïnvloeden.

Hoofdstuk 5 breidt de analyse van de payout policy van de VK ondernemingen uit. In een dynamische panel data regressie opzet (Blundell en Bond, 1998), relateer ik de target payout ratios aan de eigendomsstructuur variabelen. Winstgevendheid bepaalt de payout beslissingen van de VK ondernemingen, maar de aanwezigheid van sterke groot-aandeelhouders of blok aandeelhouders coalities verzwakken de relatie tussen omzet en payout dynamica aanzienlijk. Alhoewel de invloed van de zeggenschap van de coalitie op de payout ratios negatief blijkt te zijn, de omvang van dit effect blijkt te verschillen over de verschillende categorieën van groot-aandeelhouders (i.e. industriële ondernemingen, families en individuen, directeuren, financiële instellingen). De aandeelhouders die de leiding hebben lijken de agency problemen van de free cash flow af te wegen tegen het risico van underinvestment, en proberen payout policies te forceren die deze kosten optimaal in balans brengen. Tenslotte, het hoofdstuk verbetert een aantal methodologische tekortkomingen van de recente empirische studies van de payout policy die zijn verschenen.

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